COMPUTERWORLD

INSIDE

Backs to the wall at Hutton MIS

Shearson expected to scrap hardware, dismiss staff as part of merger plan

BY ALAN ALPER
CW STAFF

NEW YORK — E. F. Hutton & Co.'s dismantled operating architecture may be dismembered and a large number of its information systems employees dismissed as a result of Shearson Lehman Brothers, Inc.'s proposed $1 billion acquisition, according to sources close to both companies.

Shearson's centralized pro-

cessing philosophy, observers suggested, is unlikely to accommodate Hutton's departmental Branch Information Processing System, known as BIPS, which provides office automation and local processing services to each of the firm's 400 branches.

"I don't think they'll keep [BIPS]," said a high-level Hutton MIS executive who asked to remain anonymous. "It's not a brand system."

Jack Owens, senior vice-president of information systems at Shearson Lehman, acknowledged that the merged company would not need all of the current information systems staff members from both companies but

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Wall Street aftershock

MIS staff may face its own crash with Shearson Lehman expected to eliminate information systems duplication

INFORMATION PROVIDED BY SHEARSON LEHMAN AND E. F. HUTTON

DEC exec: Mainframe VAX in '88

BY JAMES A. MARTIN
CW STAFF

ANAHEIM, Calif. — A Digital Equipment Corp. official last week confirmed reports that the company will release, by mid-1988, a mainframe-class VAX system capable of performing about 22 million instructions per second.

The official also said DEC is exploring ways to extend the VAX architecture beyond its current 32-bit limit, thereby providing a performance growth path for the 1990s.

The next major VAX release carries the code name "Polar Star," according to Bill Demmer, vice-president of DEC's Mid-Range Systems Business Group in Boxboro, Mass. He said the release will roughly double the performance of DEC's current high-end VAX 8800, which is generally rated at about 12 MIPS. Demmer made his comments during Dexpo West '87, a
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Lowe sees varied Micro Channel role

BY ED SCANNELL
CW STAFF

WHITE PLAINS, N.Y. — IBM is piecing together a technical workstation strategy that will eventually yield multiuser versions of OS/2 that operate across its entire line of IBM RT Personal Computers and high-end Personal System/2s, according to William C. Lowe, president of the company's Entry Systems Division.

This strategy, which will largely center on Unix, calls for an implementation of IBM's Micro Channel architecture on the RT PC. In a recent interview with Computerworld, Lowe also said the company plans to do the following:

- Create bridges where necessary to better tie Unix with IBM's Systems Network Architecture.
- Implement the Micro Channel architecture bus on "the entire [PS/2] product line" as well as on a broad range of multiuser systems.
- Make OS/2 Extended Edition run better on PS/2 systems by

exploiting IBM's reported advantages in asynchronous interrupts.
- Build a System/36 "applications platform" on OS/2, but will focus on IBM's Systems Application Architecture to connect PS/2s to larger systems.

Since July, when IBM merged the RT PC and PS/2 development teams, the company reportedly has been working on a series of products that will bring the two technologies closer together.
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The 16K of memory is fine, but the price of punch cards is going through the roof

BY STANLEY GIBSON
CW STAFF

As a computer, it may be a heck of a printer. But that beats being a tout anchor.

Some 28 years after it first shipped and 21 years after it was discontinued, the IBM 1401 is still being run by several customers.

Although the machine can be programmed only in obscure languages, was dropped from IBM maintenance in 1981 and has a maximum memory capacity of a minuscule 16K bytes, a community of users is putting the machine to productive use.

In fact, several enthusiastically sing the processor's praises.

The 1401 was the first IBM computer to use transistors and, because of its moderate

IBM's 1401 *still up and punching*

price, was the first to be available to a wide range of users, according to Jack Hart, an ana-

lyst at market research firm International Data Corp. Hart was an IBM salesman when the 1401 was introduced and says he sold several of the machines.

The processor enjoyed a highly successful life — some 12,484 were sold, according to IDC — before it was eclipsed by the landmark IBM 360 family of computers in the mid-1960s.

"You have to be a programmer over 40 years old. There are just not that many left. I happen to be one of them," says Don McCoy, president of Dallas Computer Management, Inc., located in Dallas. McCoy pro-
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NEWS

Hold that lawsuit!

Sybase says illegal copying charge a mistake

BY ROSEMARY HAMILTON
CW STAFF

A 2-week-old legal scuffle between Oracle Corp. and Sybase, Inc. came to an abrupt end last week with Sybase admitting it had wrongly accused Oracle of illegally using and copying its software. It seemed like a David and Goliath story gone wrong.

Last month, Sybase, which got off to a fast start this year in the relational data base management field, took on Oracle, which has rapidly become a major force in this market. Oracle raked in $131.3 million in revenue for its 1987 fiscal year, a 137% increase from last year's $55.4 million.

The smaller Sybase ended up in the awkward position of withdrawing its complaint, leaving it in an even shakier relationship with its much bigger rival.

In the lawsuit, filed Nov. 23 in U.S. District Court in San Francisco, Sybase asserted that Oracle had wrongfully used and copied its software, the Dataserver and the Data Toolset, which were designed for on-line transaction processing environments.

In subsequent negotiations between the two firms, it was learned that Oracle did not have the Sybase software, attorneys for both firms said last week.

Taboo turnout

The situation for Sybase almost went from bad to worse when the negotiations revealed that a copy of the Oracle data base management system was apparently at Sybase. Raymond Ocampo, assistant legal counsel for Oracle, said it first appeared that Sybase may have engaged in the very same activity of which it had accused Oracle.

Further investigation showed that the software in question belonged to a Sybase employee who had previously worked for Oracle. "There is no evidence that the software was obtained illegally or that it had been used," said Peter Couture, a partner at Wilson, Sonsini, Goodrich & Rosati, the firm representing Sybase.

Attorneys for both companies said that each has agreed to return any of the other's software that might have been in its possession, even though neither expected to have the other's software.

United data scrambled in O'Hare terminal fire

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — A small rubbish fire underneath the concourse at United Airlines' O'Hare International Airport terminal two weeks ago damaged voice and data lines enough to cancel 175 flights and strand thousands of passengers, United said last week.

"The reservation people had to handle everything manually, and they really couldn't keep up with the volume of work normally handled by our computer systems," United spokesman Joe Hopkins said.

On a normal day, more than 70,000 people pass through United's terminals, arriving or departing on one of 800 flights. Independent estimates put the number of stranded passengers at nearly 10,000.

Thousands of circuits hit

The fire, one of three that broke out on the evening of Dec. 3, began in an out-of-sight area near the terminal's baggage handling facility. By the time it was discovered, it had burned through protective sheathing around 5,000 multiplexed voice and data circuits. The damage interrupted service at any phones and reservation stations, as well as knocking out data to most United reservation CRTs at O'Hare.

"The cables were just a mass of copper and fused insulation," said Illinois Bell spokesman Richard Hill. "But even though they were in terrible shape, none of the data lines to the [United] Apollo reservation system had been working."

The problem worsened the following morning, when telephone repair crews started to replace the damaged lines. "In trying to repair the charred cables, live wires were cut," Hopkins said. He declined comment on whether United was internally investigating the fires, which were initially considered suspicious by the Chicago Fire Department. The fire department did not pursue a separate investigation, spokesmen said.

Suspicious or not, the fires at United's terminal and the summer flooding of other Chicago businesses show how vulnerable computer and communications facilities are to disruption. United's Chicago-area reservation service, located in nearby Elk Grove Village, was unaffected.

Airlines face Senate turbulence

Reservation systems cited for anticompetitive, anticonsumer potential

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — U.S. Sen. Howard M. Metzenbaum (D-Ohio) warned major airlines last week that they must resolve controversies over their own reservation systems or face a more drastic legislative remedy.

Airline-owned reservation systems "may be a potent tool of consumer deception and unfair competition," Metzenbaum said at the start of a hearing conducted by the Senate Subcommittee on Antitrust, Monopolies and Business Rights.

Several people critical of the way American Airlines and United Air Airlines have used their systems for competitive advantage urged Congress to require divestiture by forcing the airlines to sell their reservation systems to third parties.

The critics included consum-

er activists, who said the systems are biased toward their owners; small airlines, which decried the high fees they must pay to be listed on the reservation systems; and travel agents, who opposed contractual terms that discourage them from switching systems.

"As long as airlines own com-

puterized reservation systems, they can benefit from the incremental revenue that can be created by distorting traveler choices," testified Michael E. Levine, a management professor at Yale University.

On the other side of the debate, executives who are in charge of American's Sabre system and United's Apollo system said there is no need for additional regulation or divestiture, which would rob them of their heavy investments in the technology.

"For the past several years, carriers that chose to invest their resources elsewhere have been attempting to use the legislative process and the courts to deprive American of the fruits of its success," testified Michael A. Buckman, president of Sabre Travel Information Network, a division of American.

Travel agencies, the frontline users of the systems, argued that American and United impose onerous contract provisions intended to prevent them from converting to another system.

Because American and United together control more than

70% of the market, they can impose contract terms — such as "take-it-or-leave-it" terms, according to a representative for the American Society of Travel Agents.

A petition to DOT

The group urged the U.S. Department of Transportation or Congress to restrain the major airlines' market power by establishing a standard set of contract terms that would eliminate the abuses.

But officials from American and United said the contract terms are necessary to defend against Texas Air's recent efforts to steal customers away. The so-called conversion wars have landed in court because of disputes over breaches of contracts [CW, Nov. 30].

Northwest Airlines and Texas Air's System One Corp. subsidiary urged Congress to make it easier for travel agents to switch vendors, while America West Airlines and the Consumer Federation of America called for divestiture.

SAS widens PC line, improves portability

BY DOUGLAS BARNEY
CW STAFF

CARY, N.C. — For the first time, graphics, data entry and applications development tools will be available on personal computers from SAS Institute, Inc., which today is scheduled to announce a new version of its SAS System for Personal Computers.

While SAS is still largely a purveyor of host-based applications, the new PC version of the software is part of the firm's overall strategy of bringing its mainframe capabilities to less expensive personal computers.

"With OS/2 and 386 machines, we will see a lot of corporate computing that is going to be done on PCs rather than a mainframe," said SAS President James Goodnight said. "Our users have asked us to bring SAS, in its entirety, to the PC."

There are currently more than 270,000 licensed PC workstation users, according to SAS.

Three free modules

The new version of the PC software, set to ship later this month, includes three new modules: SAS/Graph, for graphics; SAS/FSP, for data entry, editing, querying and letter writing; and SAS/AF, for applications development. The new version will be provided free to licensed SAS PC workstation users.

SAS/Graph for PCs mimics

the features of SAS/Graph for mainframes and is aimed at sophisticated graphics applications. It includes the ability to produce three-dimensional graphics; scatter and contour plots; and surface, block and prism maps.

SAS/FSP is billed as a "complete information processing system" for data entry, querying, editing and letter writing. With the product, users can design features, spreadsheet work with data and create links to data base management systems such as IBM's DB2, the company said.

SAS/AF is an applications development system with menu design features. SAS said the product can create fill-in-the-blanks applications.

One user applauded the move. "The use of a personal workstation to do graphics or enhance your ability to do data entry or develop applications that could be uploaded to a mainframe is the direction to go in," said Mike Schmidt, manager of systems planning and administration for Moody's Investors Service, Inc. in New York.

"We would like to have an environment that is completely separate from a mainframe, where a programmer cannot accidentally write an application or test an application during production hours," Schmidt said.

But for some uses, the PC is not the answer, according to SAS. "The mainframe will have

A graphics module is one of three additions designed to bring mainframe-class capabilities to the PC version of SAS.

a larger variety of graphics output devices connected to it, such as the more expensive plotters and cameras," Goodnight explained. "Also, that is where the large corporate data bases are, so it will make sense to keep SAS on the mainframe for the really large jobs, such as overnight plotting and camera-ready art."

The portability of C

The SAS System for Personal Computers has been written in C and designed to be portable to other architectures, SAS said. This new PC software will serve as the basis for the firm's future host products, Goodnight said. "This system represents a single system that will run the same on all machines SAS software currently supports."

SAS enhanced its graphics, data entry and applications tools as it moved them to the PC. "We have added the ability to use a menuing system to menu each of the procedures in the graphics area," Goodnight said. He ad-

ed, however, that the product is still aimed at sophisticated users.

"It is still predominantly a mainframe graphics tool that has been brought down to the PC."

SAS also provides a communications link between its PC products and its host applications through SAS/Micro, a terminal emulation program.

Existing PC modules have also been enhanced. The base SAS software features expanded data management tools. The software's statistical component, SAS/Stat, will include new procedures for analysis.

And SAS/IML, an interactive matrix facility for statistics, mathematics and engineering, will include 10 additional time-series functions and eight additional matrix functions, some aimed at solving quadratic and linear programs.

The SAS System for Personal Computers is licensed on a yearly basis. Prices range from $495 for a single workstation to $8,495 for 500 workstations.

First OS/2 users want more

Remains programmer's plaything until strategic pieces fall into place

BY ALAN J. RYAN
CW STAFF

Soon after IBM shipped the country with 20,000 copies of its long-awaited OS/2 Standard Edition Version 1.0, early users said they were impatient for its other strategic pieces.

Some companies contacted last week said OS/2 will be only marginally useful — more of a programmer's plaything — until further releases, including communications capabilities in the Extended Edition and the graphical user interface of the Presentation Manager, become available. The Extended Edition Version 1.0 will ship in July 1988, the Standard Edition with the Presentation Manager will ship in October 1988 and the Extended Edition with the Presentation Manager will ship in November 1988, according to IBM. IBM began shipping the Standard Edition Dec. 4, but many who placed orders for it said they had not received it as of Dec. 11.

Early users said OS/2 is easy to install, lives up to IBM's promises and has few problems.

"I think OS/2 is going to become the standard environment for our intelligent workstations" over time, said Henwell Chou, a

second vice-president with Travelers Insurance Co. in Hartford, Conn.

During the next six months, though, Chou said he sees little use for the operating system. "We'll be testing it and probably trying to develop software for it," he said.

Not for end users yet

A technical support specialist at a Fortune 100 company, who received a production copy of OS/2 late last week, said only programmers need OS/2 at the present time.

"If I were running a business, I'd have my heavy PC support groups running [OS/2] and using the compatibility box [the mode designed to preserve the user's investment in existing software] just to become familiar with it. But there's no reason for end users to get involved. There are no applications for it," the technical support specialist said.

One user at a major national bank, who has been working with a beta-test version of OS/2, said that while OS/2 "definitely does multitasking and definitely relieved our memory constraints, we don't have the Extended Edition, so we have to back away from our PC LAN for

now. The lack of communications in the Standard Edition has limited its practical usefulness."

"We're impatient," said Joseph Brophy, senior vice-president of information systems and data processing at Travelers. "We think [OS/2] is the right direction, but we want OS/2 Extended and all the tools and utilities so we can get it into the production environment."

"We're very much an IBM shop," said Ed Ginorio, manager of customer computing support at Dun & Bradstreet Corp. in Basking Ridge, N.J. But Ginorio said he is in no rush to purchase OS/2.

Users who did not choose to wait, though, said OS/2 has met their expectations.

The technical support specialist said it took less than a half-hour to install the operating system onto his IBM Personal System/2 Model 80. OS/2 arrived on four 1.4M-byte 3½-in. disks, he said.

"It has glitzy color screens that step you through the disk swapping and installation processes and requires no reference to the manual," he said.

The program, the early users said, requires a minimum of 1.5M bytes of memory.

"It would not install on the 1M-byte PS/2 Model 60," said Ed Tulson, president of software developer SofLogic Solutions, Inc. in Manchester, N.H.

"Assuming you're going to run the compatibility box at all, plus some protected-mode applications, it's more reasonable to have 2.5M bytes to 3M bytes of memory," said Adrian King, director of product marketing for operating systems at Microsoft Corp., which co-developed OS/2.

Once installed, moving IBM PC- or Microsoft MS-DOS data, models and custom applications to ported OS/2 programs work in much the same way as setting up a new DOS machine.

The user would back up his disk, install OS/2 on the disk, copy data files back in and install the applications according to their instructions, King said.

A main feature of OS/2 is its ability to run DOS files, but the users and Microsoft said not all DOS files will run under the compatibility mode of OS/2.

King conceded that there are some programs that will not work exactly the same way in the compatibility box of OS/2 as they do under DOS.

Executive Editor Paul Gillin, Senior Editor Douglas Barney and West Coast Manager Kathy Chin Leong contributed to this report.

So where is it?

S tep right up. Get your OS/2 Standard Edition 1.0 here."

Sound familiar? Not likely. IBM shipped 20,000 copies of OS/2 on Dec. 4, but few have surfaced.

Several large dealers contacted last Thursday said they had not received the new operating system but were expecting it. A spokeswoman at Computerland Corp. said OS/2 was due to arrive in the store's warehouses late last week and would have to be inventoried before being sent to dealers. She said it could be on dealer shelves by Dec. 16.

Businessland, Inc. said anyone seeking a copy will probably find it at Businessland by Dec. 21. In Lobert, president of Compucom Systems, Inc. in Cherry Hill, N.J., said his customers may find OS/2 in his store later this month.

ALAN J. RYAN

Lowe

"If we are going to build a series of workstation products that use both the Intel [Corp.]-based PS/2s and the reduced instruction set computing-based RT [PC] products, we would do a better job of it if we have them organized together," Lowe said.

Demonstrating the flexibility of the high-end PS/2s, Lowe said, IBM will eventually support the systems in four different multiuser configurations through the AIX operating system, as a System/36 platform, through a multiuser version of OS/2 and as a file server.

The RT PC reportedly will be used as a file server and multiuser system and will run a multiuser version of OS/2. The key to tying all these configurations together is SAA, Lowe said.

Integral to strategy

Turning to the potential of the Micro Channel architecture, Lowe said many people underestimate its abilities, adding that it will be an important part of the company's strategy throughout its entire family of products.

"Through time, you'll see the Micro Channel on quite a few implementations. For the same reason it makes sense for [the RT PC] people to talk of the re-

sources that have been spent on the Micro Channel, it will make sense for other people to interface with the I/O devices that we do for the PS/2 [and through multiple implementations], it also makes the job of SAA easier," Lowe said.

With the help of the Micro Channel architecture, IBM will be better able to cure OS/2 Extended Edition to its systems in less time than would ordinarily be expected by exploiting the advantages they have in communications, Lowe said. He added that the area in which many inferior clone makers come up short is asynchronous interrupts.

"In a communications environment where you get a lot of asynchronous interrupts, we can really take advantage of the Micro Channel's capabilities," Lowe said.

IBM's apparent new commitment to Unix marks a departure from its lukewarm support in the past. Unix was previously provided as an "accommodation" to customers who felt the operating system was critical to running their businesses, Lowe said. During the past year, however, an increasing number of customers want Unix from IBM, Lowe said, adding that IBM centered much of its workstation strategy

for the RT PC and PS/2 around Unix.

Despite having OS/2 on the RT PC and AIX on the PS/2s, IBM intends to establish a consistent user interface across its workstation line, Lowe said.

Multistep process

He said this process will be done in several stages. The first step is putting the AIX/X Windows interface on both the PS/2 and RT PC. The second step involves putting OS/2 on the RT PC, which Lowe said gives that system "all the attributes of the PS/2."

"So a likely thing to do is to take the steps to make AIX/X Windows conform," he said. "But we aren't going to do things that make it difficult to port Unix applications."

In cases where there is an un-

compromising conflict between Unix and SAA, IBM will build the necessary bridges for developers to port over their applications, said Andrew Heller, vice-president and general manager of IBM's Advanced Engineering Systems Division. In most cases, he said, it is technically feasible to move people from one environment to another within the system without users realizing they have switched.

While the RT PC line and high-end PS/2s reportedly will be running both Unix and multiuser versions of OS/2 in the next few years, Lowe said there will be little overlap.

"In a couple of years, we'll probably have PS/2s that are higher performance than today's RT [PCs]. But we expect to have products in the RT [PC] family, at that point in time, which are substantially faster than the Intel-based products," he said.

The fact that IBM considers the RT PC an important Unix platform in the future comes as a surprise to many observers who believe the system has sold poorly since its introduction in January 1986. Heller admitted the original RT PC did not have the necessary software and expansion capabilities to make it successful.

William Lowe

PS/2 BIOS set for June

IRVINE, Calif. — Users can expect systems compatible with IBM's Micro Channel-based Personal System/2s to be available by June, according to officials at both Western Digital Corp. and Phoenix Technologies Ltd.

The companies last week signed a joint development agreement to create a series of read-only memory BIOS products. In combination with Western Digital's chip sets and board products, announced in October, the product will allow OEMs to deliver systems compatible with the PS/2 Models 25 and 30, both of which use the IBM Personal Computer AT bus, and the Micro Channel-based Models 50, 60 and 80.

There is tremendous interest in the BIOS products from OEMs, according to Bill Franks, vice-president and general manager of Western Digital's Strategic Products Business Units.

IBM has said it will not license design patents on the Micro Channel but will offer utility patents, providing vendors with the tools necessary to create a workable system.

PS/2 legal web still tangles vendors

BY JULIE PITTA
CW STAFF

SANTA CLARA, Calif. — Legal issues surrounding certain models of IBM's Personal System/2 family of microcomputers are still unclear more than eight months after the line's introduction, according to personal computer makers, chip manufacturers and resellers.

At a panel discussion here last week, industry figures expressed frustration at the lack of information regarding IBM's proprietary Micro Channel architecture.

Additionally, they said IBM has failed to prove that the new architecture offers any significant performance advantages over the company's Personal Computer AT bus line.

"I'm appalled that it's eight months down the road and the industry still doesn't have a clear understanding of the patent issue," said Enzo Torresi, vice-president of product and strategic planning for Businessland, Inc. "I'm not going to be the first to resell [a Micro Channel clone] product."

Vendor reluctance

A number of microcomputer vendors, including panelist Safi Qureshey, president of AST Research, Inc., have publicly stated that they are investigating the possibility of producing a Micro Channel-compatible system, but they are reluctant to be the first to introduce such a product.

Gordon Campbell, chairman and chief executive officer of Chips and Technologies, Inc., said that he is not "aware of a single PC-compatible manufacturer" that is not looking to clone the PS/2 line.

Campbell said manufacturers' legal fears will delay PS/2-compatible introductions but not prevent them. Chips and Technologies has been in discussions with IBM's legal department for several months, he added.

Panelists said IBM has been

adept at tying the Micro Channel and the OS/2 operating system, jointly developed by IBM and Microsoft Corp., together in users' minds.

They added, however, that the two products are unrelated to overall system performance. "I can't find a single software advantage to the Micro Channel," said Gordon Eubanks, chief executive officer of Symantec Corp.

Other panelists said IBM has failed to prove any performance advantage gained through the Micro Channel. "It's been eight months, and they haven't proven

anything," AST's Qureshey said. "The benchmarks will have to be in real applications and real environments."

In a later speech, William Lowe, president of IBM's Entry Systems Division, defended the Micro Channel. "I/O suppliers at the Las Vegas Comdex [show this fall] told us that the Micro Channel offers functions that cannot be done on anyone else's

architecture base," he maintained. "The PC AT bus architecture was essentially out of gas."

Lowe said there are patents pending on specific elements within the Micro Channel: IBM does not intend to offer licenses to its design patents but has traditionally offered utility patents, which explain what a component does but do not detail its design.

CORRECTIONS

The new Compaq Computer Corp. desktop personal computers, announced in October, carry 5¼-in. hard disk drives from Control Data Corp.

While CDC would like to ship Compaq a new type of 3½-in. drive, mentioned in Inside Lines [CW, Nov. 30], it has reached no agreement to do so, CDC officials said.

The 5¼-in. Wren drives that Compaq is using have a capacity ranging from 51M to 182M bytes, CDC said.

The telephone number for Centigram Corp. [CW, Nov. 9] is actually 408-942-3500.

Netware OS/2 support revealed

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Novell, Inc. last week outlined a two-pronged strategy to support OS/2 on a network server under its Netware operating system.

Novell's dual approach will provide users full compatibility with IBM and Microsoft Corp.'s OS/2 without affecting the performance of server-based applications, said Craig Burton, Novell's senior vice-president of corporate development.

In a briefing here, Novell set a first-quarter delivery date for supporting conventional distributed applications and external server-based applications under OS/2. The company also said it would support the OS/2 applications program interface, as defined by IBM, with its Netware Requestor.

Novell said it will deliver support for internal server-based applications running under OS/2 as well as support for OS/2 Ex-

tended Edition via the Applications Coprocessor board in the fourth quarter of 1988. Also planned is support for IBM's Advanced Program-to-Program Communications peer-to-peer communications protocol.

With these announcements, Novell attempted to puncture what it called the myth that the firm cannot support OS/2 on the network without licensing OS/2 and Microsoft's OS/2 LAN Manager.

Burton said developers will

not have to choose between Netware and OS/2. "It's true Netware is proprietary, but that does not mean that it is closed."

The Netware Requestor reportedly will support OS/2 Standard Edition-based workstations and is slated for delivery in the first quarter. It is priced at $50 and will require Advanced Netware Version 2.1, which shipped last Friday.

A competitive product from 3Com Corp. that also supports OS/2 workstations is scheduled for delivery in the first quarter.

The Netware Requestor, developed by Novell with assistance from IBM, reportedly al-

lows OS/2-based workstations to coexist with DOS workstations and communicate with Netware servers.

Access to all Netware services is provided, and users will be able to run both DOS and OS/2 applications, Novell said. Users will run the Netware Requestor at their workstations alongside OS/2.

The Netware Applications Coprocessor reportedly will provide Netware support for OS/2 server-based applications in the file server. The coprocessor will ship in the fourth quarter following release of IBM's OS/2 Extended Edition, Novell said.

IBM nixes LAN boasts

BY ELISABETH HORWITT and PATRICIA KEEFE
CW STAFF

BOSTON — IBM representatives last week seemed to contradict claims that applications written to 3Com Corp. and Microsoft Corp.'s OS/2-based network software will also run on IBM's own LAN Server program, which is based on IBM's OS/2 Extended Edition program.

"At this point, you cannot write to Microsoft's LAN Manager and have an application run on the LAN Server," said Edward Fritch, an IBM communications marketing manager. He said IBM is recommending that OS/2 software developers support IBM's Advanced Program-to-Program Communications (APPC) interface if they want to be compatible with IBM's distributed information systems plans.

"Developers want complete compatibility across 3Com, Microsoft and IBM, but I don't think this will happen," said Maurie Prusner, IBM's manager of local-area network products. While IBM incorporated pieces of Microsoft's LAN Manager into its LAN Server, "each vendor is providing its own enhancements" to the OS/2 networking software, he explained.

In a white paper released last month, 3Com guaranteed that 3+Open, its Microsoft LAN Manager-based network operating system, will be compatible with IBM's OS/2 LAN Server, and that 3Com would eventually support APPC.

IBM, "in its market-driven way," is trying to ensure that programmers cannot hook their software up to LAN Server's distributed networking functions except through APPC, according to Charles Pitcher, director of product planning for Rabbit Software Corp. This poses a quandary for users who eventu-

ally want to link their LANs to IBM hosts via IBM's LU6.2 but, meanwhile, want to use LAN Manager. Reportedly, LAN Manager is a simpler, less memory-intensive networking environment than APPC.

Another frustrated group, according to Pitcher, consists of would-be OS/2 software developers, who do not want to write an application once for the LAN Manager and again for IBM's APPC environment. "LAN Manager is much easier to write to than APPC for PC applications. I think the market will demand both APPC and the LAN Manager," Pitcher said.

"Some people are going to stick with IBM Netbios-plus capability," agreed IBM's Prusner. Small businesses that plan to link only personal computers may well be content with the Microsoft-3Com product, he said, but everyone else will want to migrate to APPC eventually, when they start linking their PC LANs to a distributed network of IBM hosts.

In an interview last week, Rob Glaser, director of network marketing at Microsoft, said IBM is not contradicting anything Microsoft has said. Developers' real concern should be designing their products to support OS/2, which IBM has endorsed as its server operating system, he said. IBM and Microsoft are partners in the OS/2 effort.

Fritch agreed that software written for OS/2, Netbios or IBM's PC-DOS 3.1 can access LAN Server. However, he said, IBM is "strongly recommending APPC" for users who want to ensure that their applications can communicate across a distributed IBM network.

Rabbit Software, a Malvern, Pa.-based developer of software for IBM's Systems Network Architecture, plans to offer its own implementation of APPC on the LAN Manager, Pitcher said. The firm also plans to develop its own hardware-independent version of IBM's Communications Manager, which provides LAN Server access for devices and applications supporting asynchronous, APPC, IBM 3270 and Netbios communications modes.

Hutton MIS

FROM PAGE 1

said that the firm has not yet decided which of Hutton's systems, including BIPS, will be retained. Most of the system questions, he said, are long-term issues that will be decided during the next four or five months.

"It would be foolish to do away with [BIPS] and all the software developed for it," Owens said. "We're going to take a hard look at the processors and see whether they're needed; it's a long-term question."

A busy mammoth

Just hours after agreeing to the acquisition, Shearson Lehman began the arduous task of planning how to tie Hutton's 400 worldwide branches to its own IBM Systems Network Architecture (SNA) network. Observers said they expect Shearson Lehman, an American Express Co. subsidiary, to rely on its mammoth processing capacity to handle the expected increase of business from the merged company.

Already, Shearson Lehman has ordered IBM 3270 terminals and modems as well as dedicated data lines so that Hutton branches can begin communicating on the SNA network as soon as the acquisition is completed.

"If we waited with work of this magnitude, we'd have a substantial delay integrating the firms," Owens said. "We'd lose some of the benefits of doing the merger."

Hutton's initial step in building its corporate information network was made in the late 1970s with the installation of Data General Corp. Eclipse-class processors at its regional offices. A few years latter, Hutton installed BIPS, which is based on DG Eclipse MV-class minicomputers running DG's Comprehensive Electronic Office.

A DG spokesman said his firm is discussing with Shearson Lehman how to integrate BIPS into the SNA network.

Also up in the air is what Shearson Lehman would do with Hutton's Digital Equipment

Corp. VAXs, which are used in the capital markets areas.

Shearson Lehman, which is believed to have a significant amount of excess processing capacity, is in the midst of capacity planning to ascertain its systems needs. Owens declined to provide specific capacity figures.

"We're looking at things such as what we would need if we integrated our development environments and our time-sharing VM environment," he said.

Owens acknowledged that a combined firm with more than $8 billion in revenue would not

into a combined DP/MIS unit is expected to take place during the next six months, Owens said.

Shearson Lehman's SNA network links the company's $30 international offices to an IBM mainframe complex in a state-of-the-art data center in downtown Manhattan [CW, March 9]. The mainframe complex provides more than 200 different services, such as order processing and back-office tasks, to users on IBM 3270 terminals, Owens said.

"They've built a factory with a huge amount of MIPS [millions

Difference of style

Shearson Lehman will need to reconcile conflicting systems strategies when it acquires E. F. Hutton

	Shearson Lehman	E. F. Hutton
None		400 Data General MV-class systems, ranging from Models 4,000 to 20,000; 40 DG Eclipses; Wang VS systems; DEC VAX 8600s
	3,000 microcomputers (Shearson Lehman estimate)	Banker Xerox-8ness and intelligent terminals to be replaced by 18,000 NCR personal computers during next year

INFORMATION PROVIDED BY SHEARSON LEHMAN BROTHERS, INC. AND E. F. HUTTON & CO.
CW CHART

need to keep all the DP/MIS employees from both companies. Shearson Lehman expects attrition to take care of some of the overlap, although there will be an as-yet-undetermined number of terminations, a company spokeswoman said.

"We're not going to fire only Hutton people," Owens emphasized. "We will take the best of both firms when we integrate."

MIS digits

Wall Street observers said they expect anywhere from 4,000 to 5,000 Hutton employees to lose their jobs as a result of the acquisition; many would come from DP/MIS [CW, Dec. 7]. But many of Hutton's top DP/MIS people are not expected to wait for their termination notices, insiders have said.

The entire process of transferring the management and operations of Hutton's business

of instructions per second]," said one industry observer. "It's a brick-and-mortar approach with no finesse."

Hutton, on the other hand, was an early adopter of distributed processing and has not been adverse to using non-IBM technology. It spent $100 million over a seven-year period building a single corporate information network [CW, Aug. 11]. While the company is technologically advanced, it was forced to seek a suitor because it was severely undercapitalized, Wall Street watchers have said. Recent volatility on the world's financial markets exposed its vulnerability.

The company recently began installing some of the 10,000 NCR Corp. personal computers it ordered earlier in the year to enable brokers, executives and support personnel to access data anywhere on the network.

COMPUTERWORLD

Punch cards

grams has 1401 in the once-popular but now seldom-used Autocoder language.

McCoy has one 1401 today, but had six until five years ago. The machines contain several ounces of gold, and when prices for that precious metal peaked a few years back, McCoy cashed in and sold five machines for scrap.

Makes good use of 1401

He uses his remaining 1401 to track information on 250 bowling leagues and as a backup for his IBM 370. Should his principal mainframe break down, McCoy is confident that the 1401 can handle its work

load of payroll and general ledger work. It is a bit slower than the 370, though. One job that can be done in 27 minutes on the 370 takes seven hours on the 1401, he says.

McCoy also uses the 1401 as an auxiliary printer. Should his 1,200 line/min printers be busy, he extracts data from the 370 onto magnetic tape and loads it into the 1401. The 1401's printer can produce 600 line/min of very-high quality output, he says. He adds that a new 600 line/min printer would cost $17,000, plus $300 per month in maintenance.

McCoy states that the machine's 16K-byte memory is not an extreme hindrance. "You just have to break a program into modules. You use the 16K over and over. If you wrote it for a big 370, you

would put it all into one program," he explains.

William Doyle, owner of Rand Associates in Coshocton, Ohio, another service bureau, operates three 1401s. He keeps one on-line, another as backup and a third for spare parts. The machines are used for payroll, billing and accounts payable. His principal and backup machines both use 4K bytes of memory. "In the old days, that was quite a bit," he says.

Doyle recounts that he bought his first 1401 in 1971 for $44,000 and bought the next machine seven years later at a price of $20,000. About four years ago, he purchased another for $2,000.

In contrast, the price of the punched cards the systems use has gone up sharply — from 91 cents to $4.90 per 1,000,

Doyle laments.

Vernon Durbin, head of Durbin Data Systems in Dallas, uses a 1401 with 16K bytes of memory for all his service bureau's jobs.

It works for him

"I have a PC I play on now, but it's still not like the old mainframe. It's wonderful for a service bureau," he says. Durbin runs his data center with his wife and one part-time employee. The data center's work consists primarily of processing the credit insurance that is sold with automobile loans and the like.

A 1401 user since 1962, Durbin bought his current machine in 1974 for $10,000. He now pays $400 per month to a third-party maintenance firm and pays reliability is not a problem. The machine's only drawbacks are the large amount of air-conditioning it needs and the high cost of punched cards. "The price has gone sky high," he complains.

Like McCoy, Durbin programs in the Autocoder language, which he says he is very fond. "It is possible to patch a program without recompiling it," he says, pointing out that is not possible with 360s and more advanced models. "The machine is very flexible. It made the computer industry."

Charlie Clem, president of Grand Prairie Data Services, Inc. in Grand Prairie, Texas, bought his 1401 in 1964. His service bureau continues to use the machine for payroll and accounts receivable.

Slow but dependable

"It's slow, but its very dependable. It's very reliable," Clem says. His 1401 has 12K bytes of memory, six tape drives and a 600 line/min printer.

Like McCoy and Durbin, Clem programs in 1401 in Autocoder. He estimates he uses 40,000 to 50,000 punched cards per month.

Clem says he will keep running the computer indefinitely. If it breaks down and cannot be fixed, he will buy another, he says. "You can get one with 16K and a card-reader punch and four or five tape drives for $2,000 to $3,000."

Bill Pappas, president of Mir Corp., another Dallas-based service bureau, shares the enthusiasm of other 1401 devotees. "There probably never has been, or ever will be, another machine like the 1401," he says.

However, hardheaded reality won out over sentiment in Pappas's case. He sold the last of his two 1401s a year ago and cites space and heat considerations as the reason for the sale. Each went to a scrap dealer for $2,000.

A good life

Pappas remembers buying a 1401 in 1968 for $125,000 and recalls that a complete system retailed for about $500,000 when new.

Pappas paid about $15,000 in 1976 for his first 1401, which he says he used for programming and as a backup for his 360/40. He bought another machine several months later for about the same price and had been writing programs for the 1401 in the Fargo language, which evolved into the RPG language.

Although he programs on PCs today, Pappas says he is not dazzled with newfangled technology.

"There is not a thing I do today that is not the same as I did then. Nothing has changed in 30 years. There is only more speed, storage and throughput," he says.

CPU planning shift stresses dollars, sense

BY JAMES CONNOLLY
CW STAFF

ORLANDO, Fla. — The role of a capacity planner or performance analyst may be shifting from advising an MIS director on which CPU to buy in two years toward getting the most out of existing systems or cost-justifying new applications.

Attendees at CMG '87, the Computer Measurement Group, Inc.'s international conference on performance evaluation, last week observed that capacity planners must break out of the niches in which they have been caught at many corporations.

Speakers at the conference stressed the importance of having capacity planners and analysts translate computer resource use into dollars and cents by showing senior management statistics such as a cost per I/O or the cost of a transaction for a new business venture.

'The big deal'

"A technology issue often is very hard to sell, but if you can make a financial case and a technological case and put them together, you have something to present to management — what we call the big deal," said Ed McDonald, division manager for information processing at Texaco, Inc. in Houston.

McDonald cited the example of Texaco's total replacement of IBM 3080-type mainframes with IBM 3090s during the past two years and said justifying that move to senior management would have been hard based solely on a capacity plan.

Charles E. Siegman, director of information systems at First Maryland Bancorp in Baltimore, advised attendees to become involved in their organizations'

strategic planning and to support new projects with cost analyses.

"It is very much incumbent on us to find out what is going on and present our view to management," he said.

Jim Everitt, a capacity planner for Weyerhaeuser Co. in Tacoma, Wash., said that in his company, there has been a high level of management acceptance of capacity planning but that the emphasis has been on getting as much performance as possible out of existing systems before choosing new ones.

The traditional role of capacity planner may be weakening, said attendee Les

Casgai, manager of technical support at Toronto Star Newspapers, Ltd. in Toronto.

"Things have reached a point where hardware is getting so cheap and immediately available that I think most companies don't see the need to do fantastic plans that aren't going to come about for two or three years," Casgai said. He suggested that capacity planning and performance analysis are moving closer together, with a focus on optimizing performance of existing hardware and software systems.

Phil Vasile, a principal specialist with

McDonnell Douglas Aerospace Information Services in Long Beach, Calif., said capacity planning and performance analysis are growing in his company.

A vendor representative who has been active in CMG said his firm is expanding its management services to help capacity planners communicate better with senior management. Mario Morino, president of Morino Associates, Inc. in Vienna, Va., said his firm plans new courses to help pioneers effect change and to understand the capabilities they acquire in their work.

"The desire is there to do these things, and certain key users have the wisdom. The problem is that these people aren't salesmen," Morino said. "I'm convinced that most people here have pigeonholed themselves in their organization."

Cobol to get second addendum

BY CHARLES BABCOCK
CW STAFF

The panel that recommends changes to the Cobol language has agreed to petition its supervising body to begin a second addendum process that would bring proposed clarifications and corrections to Cobol 85 before public review.

Don A. Schricker, chairman of the X3J4 Committee of the American National Standards Institute (ANSI), reported that the committee wants to initiate the second addendum while the first attempt to invoke the addendum procedure and add intrinsic functions to Cobol is under way.

The clarification and correction procedure does not indicate there are special problems with Cobol 85, Cobol experts said. Rather, it is a typical follow-up procedure to resolve ambiguities discovered in writing compilers for the new version of the language.

Once it obtains permission to proceed, the committee will debate what clarifications and corrections to include and then submit them to public review, Schricker said.

The addendum process was initiated shortly after Cobol 85 won final approval

What our transportation clients will tell you about N.E.T. T1 networks:

VM, DB2 tools lead charge toward automated DP base

ORLANDO, Fla. — Software vendors claimed progress in their drive toward automated data center operations and expanded their utility offerings, with a focus on IBM's VM and DB2, at the Computer Measurement Group, Inc.'s CMG '87 conference last week.

Boole & Babbage, Inc. renamed its System Manager for IBM's IMS to Autoperator and added support for CICS. The company claimed that Autoperator is a step toward automated data center operations because it intercepts operating system, subsystem and monitor messages and takes corrective steps automatically. CICS Autoperator works with Boole &

Babbage's CICS Manager. It is available now at $14,750 for one CPU and $22,000 for two CPUs at a single site.

Boole & Babbage also announced DASD Advisor, which is an expert system-based extension of the vendor's DASD Response Manager. While DASD Response Manager gathers, monitors and reports data, DASD Advisor assists tuning by identifying problem devices and work loads and recommending solutions in English, the vendor said.

DASD Advisor uses Aion Corp.'s Aion Development System as a shell and can be run as a troubleshooting tool when I/O problems are suspected under IBM's

MVS and MVS/XA. Existing DASD Response Manager customers can buy DASD Advisor for $7,000.

Candle Corp. said it will offer Computept, Inc.'s Intercept for MVS, CICS and IMS under Candle's Automation Facility product line in January. Intercept was designed to manage console messages and filter out useless ones, which Candle said may represent more than 50% of a system's message traffic.

Candle also entered the DB2 market with a DB2 version of its Omegamon performance management tool. Omegamon previously analyzed DB2 performance only as it affected subsystems like IMS

and CICS. Omegamon for DB2 was designed to monitor DB2 externally and warn of problems when user-defined processing limits are exceeded.

Candle enhanced its Omegamon for VM product with a graphics display designed to show how one application impacts the performance of another and to identify problems in resources like CPUs and I/O systems. The enhancement is set to be available in January, free of charge to Omegamon for VM users. The new version will support IBM's CICS/VM, according to the vendor.

Crystal bows

BGS Systems, Inc. added the Crystal Performance Evaluator to its family of analysis tools. The product adds a personal computer interface to let users draw information out of Crystal modeling support libraries. Users can then calculate end-user performance and data processing costs for new applications before committing a design to code. Versions are available for DB2, CICS and IMS.

BGS also announced Bestnet Gateway, which collects performance data from non-IBM systems. The company said the BGS VM Applications Planner, announced during the fall, is now in production. BGS officials said Encom Corp. and Duquesne Systems, Inc. have agreed to support the network gateway facility.

Softworks, Inc. released VSAM Data Compressor, which was designed to minimize the amount of effort involved in compressing data and reallocating space on disk drives using IBM's VSAM. It includes an analysis program that determines how much space and money a user can save with data compression. VSAM Data Compressor is licensed by IBM CPU classification, with initial CPU license fees ranging from $18,500 for Group 20 machines to $29,500 for Group 40 systems.

Cobol

from ANSI standard-setting panels in late 1986. The process was intended to allow additions to the language prior to the next full-scale revision of it. The proposed intrinsic functions, primarily trigonometric functions, would be an optional addition, Schricker said. Compiler writers could choose to include or exclude the functions as they saw fit for several years, prior to the next full-scale revision of Cobol.

An optional addendum may become mandatory on the next full-scale revision, depending on what the standard-setting panels decide to include, Schricker said.

The corrections addendum will be a mandatory addition, he said.

The committee decided to petition its ANSI X3 parent on corrections at a recent meeting in Austin, Texas.

NAS ties into VAX, eyes science market

BY KATHY CHIN LEONG
CW STAFF

SANTA CLARA, Calif. — Intent on entering a sizable chunk of the $19 billion engineering scientific market, National Advanced Systems (NAS) last week unveiled its first communications products that will tie its IBM 370-like mainframes to Digital Equipment Corp. VAXs.

Available as part of the new NAS Cross Systems line, the announcements include a set of front-end communications boards called Nasnet that physically link a NAS mainframe to DEC machines through a Decnet Ethernet network; communications software called Nasanlix; and Nascompute, a software transport package said to let users write Fortran applications on a DEC system that can later operate on a NAS computer.

While Nasnet and Nasanlix can be used for general-purpose commercial applications, NAS spokesman Chuck Mulloy said the highest demand for communications tools comes from users in the technical environment.

NAS user Chris Duckenfield of Clemson University in South Carolina said a communications link between IBM-compatible hardware has been needed for a long time.

"In the university environment, we work with a mixture of machines. A NAS-to-DEC connection will be extremely useful for us," Duckenfield said. "DEC will provide connections into IBM, but IBM will not offer links into DEC. The NAS product would give us the needed connections into DEC." He also said the Nascompute software will be welcome to university developers who create programs on separate machines and cannot transport them to other computer environments simply.

Nasnet, which routes data and file routing between systems, reportedly lets the NAS AS/XL or AS/VL machines appear as another node, known as Decnet.

Nasnet is sold together with Nasanlix, which offers file access, data transfer and print listings to and from a DEC VAX/VMS system. Together, the products are priced at $125,000 and will be shipped in the second quarter of next year, according to NAS.

Priced at $60,000, Nascompute will give VAX Fortran programmers the advantage of running their programs on NAS machines, which NAS said run three to four times faster than DEC computers. The product is set to be available in the third quarter of next year.

The scientific goal

The goal of the products is to give engineering and scientific users the flexibility of moving data from one hardware environment to another, according to Tom Franz, NAS vice-president and general manager for engineering and scientific operations. The products are intended to save users time and spare them the task of moving applications across incompatible architectures, he noted.

The announcements tipped off a NAS strategic focus on penetrating the engineering and scientific community. According to NAS's Mulloy, that segment represents approximately 10% of the firm's customers. Within the next three years, the company intends to bring that figure up to 30%.

While the communications products are the first sold directly by NAS, the company already sells a local-area network-to-IBM Systems Network Architecture gateway that it makes available to OEMs only.

The company is evaluating whether to sell the product directly to customers, Mulloy said.

'88 U.S. ship seen for Fujitsu drives

TOKYO — Fujitsu Ltd. last week introduced 7.5G- and 2.53G-byte hard disk drives called the Facom 6425H and the Facom 6425G, respectively.

Although Fujitsu did not specify when the products will be shipped overseas, industry watchers predicted the company will start OEM shipments between April and June next year in anticipation of the expected announcement of IBM's 3990 controller next fall.

The disk drives feature a 3M ink/sec. data-transfer rate. The Facom 6425H and the Facom 6425G offer storage access times of 24.3 and 20.3 msec, respectively, and both work with the company's IBM-compatible M series mainframe and VP series supercomputers.

Fujitsu said it boosted track density 12%, compared with its existing 5G-byte hard disk drive models. Monthly rental fees are set at the equivalent of $5,555 for the Facom 6425H and $3,185 for the Facom 6425G, with domestic shipments scheduled to begin at year's end.

The firm also added a file control system, called the Facom 1700A, that features a 4M-byte memory and four paths to write and read data. It reportedly will lease for the equivalent of $2,370 beginning in May.

EDITORIAL

To catch a thief

PSSST ... THERE'S A nefarious crook operating within your MIS shop.

It appears to be an applications programmer. Or maybe someone in data base administration. Actually, it's looking more like that guy in data entry whose girlfriend got canned last month. On second thought, maybe he is not within your midst at all. Maybe it's an outsider. Somebody with burglary tools as sophisticated as a $1,500 personal computer, a telephone and a modem.

One thing's fairly certain: If a crime in your shop is, in fact, committed, perhaps the greatest effort to follow will be in covering it up, because the news of a systems security breach can be damaging to a company's image.

As this week's Executive Report, beginning on page 73, points out, getting a handle on systems security is reminiscent of the plight of the poor groundskeeper played by Bill Murray in *Caddyshack*.

He tried nine ways to Sunday to unobtrusively rid the golf course of a pesky groundhog, his patient efforts finally giving way to dynamiting the links and still failing to uncover the pest.

The scope of the systems security issue is best illustrated by considering that anyone you speak with who has worked within a systems environment can very likely document a breach of security of which they've been aware.

For the most part, these breaches appear more as annoyances than serious threats to the organization.

But, as the report notes, the right mixture of inadequate systems security and evil intent can produce costly disasters, having immediate cost ramifications (as in the case of Volkswagen AG) as well as potential loss of consumer or customer confidence.

Undermining efforts to build more secure systems is the difficulty in selling the cost of doing so to upper management. Increasingly, chief financial officers are approving only expenditures and capital outlays that yield a quantifiable improvement in information systems efficiency. But installing adequate security measures, which can be costly, generally cannot be cost-justified the way a new payroll system can.

So, as one consultant suggested, put the value of enhanced security in terms chief financial officers can understand, such as how much money is likely to be lost in a security breach.

Be aware, too, that some systems appear to be more "breachable" these days than others. Unix-based systems are cropping up as likely targets for hackers, although this fact is prompting the accelerated efforts to tighten up that operating system environment.

Ultimately, MIS must perform a balancing act between security — and its costs — and access to data, which is becoming a foremost demand as end-user computing proliferates.

Item: U.S. software firms hire private eyes to crack down on Hong Kong software pirates.

LETTERS TO THE EDITOR

Another angle

In Fred Viskovich's article "What threatens mainframe computing?" [CW, Oct. 19], he argued that mainframe computing is a paradigm like the paradigms of scientific thought described by Thomas Kuhn in *The Structure of Scientific Revolutions*.

A paradigm in this technical sense is a set of presuppositions that forms the background for thought and debate in some area or discipline but is not the subject of rational thought or debate. As Kuhn remarked, one paradigm is abandoned for another not when it succumbs to the superior rational merits of its successor but when those in power who support it either die or retire.

The two letters that have already appeared in response to Viskovich's article have unwittingly confirmed his thesis. Joseph Vincent [CW, Nov. 9] sneered openly at Viskovich's conclusions. David Dick [CW, Nov. 16] attributed to Viskovich the absurd conclusion that an IBM Personal System/2 Model 80 is, without any qualification, equivalent to an IBM 4381 Model 12 — an attribution difficult to justify even after a very unsympathetic reading of the article.

If this is the best mainframe defenders can do against Viskovich, then perhaps he has uncovered a paradigm to which commitment is more emotional than rational.

At the risk of further confirming the thesis about mainframe computing as a nonrational issue, I will suggest that, given current technology, there is one reason why peer-to-peer networks of PS/2 machines are not

about to replace mainframes for complex, intensive corporate computing tasks any time soon.

The property of shared-memory computer systems, sometimes referred to as space-time coherence, allows a single operating system in control of such a computing complex to determine the status of each processor in that complex in order to allocate system resources efficiently based on this information. Distributed systems, lacking shared memory, must instead rely on polling and message-based communications to determine the state of the entire computing complex, because this kind of communication is terribly slow compared with the speed of the processors themselves. By the time information

about the state of each processor has been collected at a single point of control, these processors have gone on to new states, thus rendering the information useless as a basis for making decisions. Clearly, a typical commercial mainframe computer, as a shared-memory system, has the property of space-time coherence and can therefore make use of available system resources such as processors and memory much more quickly and efficiently in carrying out large, intensive computing tasks than a distributed system of otherwise comparable capabilities can.

None of this really argues against Viskovich's conclusion about the inessentiality of mainframe computers to serious corporate computing, however, unless technological progress somehow stalls short of producing interprocessor communication speeds approaching the speeds of the processors themselves. The lack of space-time coherence in distributed systems is a function of available technology for interconnecting the processors they comprise, and this technology is hardly standing still. Viskovich may have been correct in suggesting that IBM's PS/2 Micro Channel is a milestone along the way.

John Seefeldt
Director
Bureau of Information Services
Pennsylvania Treasury
Department
Harrisburg, Pa.

This week in history

Dec. 12, 1977
President Carter forms a commission to deal with the problems created by large antitrust cases such as those involving IBM and AT&T. The commission will work from the assumption that the antitrust laws are what they should be, but better procedures to expedite their denouement need to be developed.

Dec. 13, 1982
Burroughs Corp. unveils its largest computer system to date — the B7900 — which reportedly boasts up to 16 times more memory than the firm's previous top-of-the-line processor, the B7800.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

4GLs: Are we talking the same language?

Vendors must emphasize more than technical excellence to sell their products' benefits to MIS

EFREM MALLACH

Suppose a vendor appears in an MIS director's office and proudly says, "I can cut your staff's programming time in half across the board." Should the MIS director throw him out? Of course not. But MIS directors do throw him out every day.

The vendor is probably selling fourth-generation programming languages. Their productivity benefits are unquestioned. A factor-of-two productivity increase is a conservative assessment; some observers estimate a factor of five or 10. Resource utilization is less of a problem than it once was: the languages have improved, and MIPS are cheaper.

The resistance of MIS profes-

Mallach is a faculty member of the Boston College School of Management and a consultant to user and vendor executives. Based in Needham, Mass., he recently published Win Them Over: A Survival Guide for Corporate Consultant Relations Programs.

sionals remains, however. The reason is that the real objections to fourth-generation languages have little or nothing to do with their merits. Technical objections may be raised to cloud an issue, to snow nontechnical executives or to create an aura of scientific objectivity, but they are seldom the heart of the matter. The resistance is often based on personal factors.

Impressive, but . . .

To be sure, productivity gains of 50% would be impressive, but the real gain depends on the following:

Time on the job. How long does a programmer stay on a project before finishing the task, moving to a different one, resigning, being promoted to manager, transferring to end-user support, becoming a systems analyst or otherwise leaving that specific task? On the average, no more than 12 months.

Amount of time on the job spent programming. Defining requirements, designing files, planning algorithms, documenting screen layouts, training and

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Big Blue as the customer

STANLEY GIBSON

For IBM, 1987 may have been the year of the customer, but 1988 could well be the year in which IBM becomes the customer.

IBM recently acknowledged that it is trying a policy in which it acts to a point of reference for all of the maintenance in a data center.

If your Memorex Corp. disk drive breaks, you call IBM. IBM in turn notifies Memorex. In this way, a customer doesn't have to worry about who to call when something goes down. IBM does that.

This maintenance move has caused some operations manag-

Gibson is a Computerworld senior writer.

ers to speculate that IBM may go one step further and take over the running of data centers completely.

Ridiculous? Yes — particularly when the IBM sales representative calls on an IBM data center manager.

"Hi, Bob Williams?"

"Yes?"

"This is Bill Roberts from IBM. Just thought I'd stop by to see how everything was going. Beautiful day, isn't it? Say, nice suit. You don't see too many MIS execs who know how to dress. By the way, I thought I'd tell you about a special limited-time offer we have to upgrade your communications controllers."

"Nice try, Roberts, but you know how tight budgets are at the end of the year. Besides, you did such a good job of selling equipment to the guy that used to work here that upper management's put a freeze on new purchases."

"Yes, of course, but maybe the senior V.P. would be up for a game of golf to talk it over. Have you thought of adding some memory to your CPU to boost your DB2 performance?"

"Nope. But since you're here, maybe you IBM guys would like to

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Toward a new global economy

The U.S. must foster collective entrepreneurialism to remain competitive

JOHN KIRKLEY

Sometimes it seems that almost everything not nailed down is being bought by foreign investors. For a while it was the OPEC nations, now the Japanese, the English and the French.

As our balance of trade droops deeper into deficit, as the stock market swoops and slides, as the newly industrialized countries like Korea, Singapore and Taiwan keep nipping at our heels with higher productivity and lower prices, as our leaders in Washington, D.C., keep stepping on their tongues, seemingly incapable of dealing with an economy in disarray, as foreign countries buy up our corporations and real estate, there are those who are throwing up their hands and resigning the U.S. to a slow decline to third-rate status in the world's marketplaces.

However, a few see some light in the deepening economic gloom. John Young, chief executive officer of Hewlett-Packard Co. and chairman of the President's Commission on Industrial Competitiveness, told attendees at the fall Seybold Executive Forum that a new, redoubled striving for quality can bring our industries back into the competitive ball game.

Young called for total quality control within businesses, not just in the manufacturing and production areas, but at every level of the organization, from the janitorial staff to the executive boardroom. He urged U.S. companies to begin thinking of the global marketplaces, noting that fewer than 100 firms in this country produce more than 80% of the exports.

Numbering down

To those who want to hunker down, tighten their belts and adopt a survivor mentality, Young said that the worst thing we could do would be scale down our efforts. He commented that the U.S. is still by far the world's technological leader and urged us to bring the same expertise and energy to the rest of the product cycle — to develop, market and distribute our wares with the same Yankee ingenuity

that we bring to our product concepts.

Young was followed on the podium by the irreverent Robert Reich, an economist from Harvard University's Kennedy School of Government and author of the best-seller, *The Next Frontier.*

Reich was very serious, however, when he asked how the business community could be competitive in the world's markets when 22% of our children are living below the poverty line, the highest number in 18 years; 30% of 18-year-olds do not finish high school and, of these, 20% are functionally illiterate; and

older industrial economies have two options: They can try to match the wages for which workers elsewhere are willing to labor; or they can compete on the basis of how quickly and well they can transform ideas into incrementally better products.

A different approach

This second and obviously more appealing option implies a fundamentally different approach to the notion of entrepreneurialism. Instead of a few lone entrepreneurs producing a few industry-making Big Ideas, innovation must become more continuous and collective.

TOM LULEVITCH

70% of new Ph.D.s did not go to work on new commercial products or corporate research and development in 1986 but instead were engaged, either directly or indirectly, on military projects.

'Paper entrepreneurs'

Of all the research and development in the private sector, 35% is paid for by the government, Reich said, and 80% of that is paid for by the Pentagon. He bemoaned the fact that his brightest students were not heading for marketing, sales or other corporate jobs but were instead looking toward Wall Street to become "paper entrepreneurs."

In his new book, *Tales of a New America,* Reich notes that in the past, companies searched for what he calls "The Big Ideas." Once the hot new products were brought to market, they followed a predictable life cycle and were finally discarded to make way for the next Big Idea.

"In the new global economy," Reich writes, "nearly everyone has access to Big Ideas (and the machines and money to turn them into standardized products) at about the same time and on roughly the same terms. The

Products no longer follow a predefined life cycle; instead they evolve. Vacuum-tube radios become transistor radios, then portable earphone radios, then compact disks and then optical-disk computer memories.

"This pattern of ongoing, incremental evolution depends on the cumulative expertise of a great number of people," Reich says. He stresses the role workers play: They "add value, not solely or even mostly by tending the machines and carrying out routines, but in the analysis, experimentation and the application of creativity."

In contrast, today's business environment, which supports and rewards individual opportunism, has led to the era of the corporate raider, the Wall Street scandals and worse, the rise of a whole new class of individuals who "get paid for rearranging economic assets rather than enhancing their value," Reich says.

"The new reality of global competition," as Young called it, is the rallying cry for U.S. business. Can we find new ways to compete in the world's markets? Can we make the label "Made in the U.S.A." synonymous with

Kirkley is an industry consultant currently acting as editorial advisor to Patricia Seybold's Office Systems Group. He is based in South Norwalk, Conn.

4GLs

users, going to meetings, taking vacation, holiday and sick time and so on means that, at best, half of a person's time on the job — or six months — is spent actually programming.

So cutting programming time by 50% will save three months work.

The time it takes to learn a fourth-generation language. These languages are not standardized. There are few applicant pools for any given one of them. Usage skills in one language are not directly transferable to another language. If it takes a programmer three months to become proficient with a

fourth-generation language, the productivity gain is gone; more than three months results in a net loss.

Applicants experienced in Cobol or other widely used, standardized languages have been told for years to nurture these valuable skills. They have been rewarded for them and know that programmers with these skills are always in demand.

Should they risk a career detour because a silver-tongued dreamspinner intones, "Fourth-generation languages are the future?"

Future values

Programmers face a more severe psychological crisis. The same manager who sent them to CICS Cobol class last year

now wants people who know Focus! What does this change say to the current staff about the future value of their skills to their employer?

Revolutions have been started over much less.

Meanwhile, fourth-generation language vendors are doing the following wrong things:

• They are improving efficiency. There's certainly nothing wrong with efficiency, but it's not the real issue.

• They are adding features.

• They are competing on the basis of "We have 10 numeric data types, and the other guys only have six." That's not where it's at either.

What should vendors of fourth-generation languages do?

• Sell to the upper MIS executives. The payoff of fourth-generation languages is greater over their longer-term horizon.

• Promote standardization. Don't squabble over percentage points of the pie; expand the pie.

• Reassure programmers that their essential skills are language-independent. A fourth-generation language lets them express ideas and implement concepts more quickly.

• Provide transition help. Most courses and manuals start from an elementary, neutral position. There is a need for training and documentation that respect students' or readers' existing expertise on using terminology they are familiar with — explaining by analogy to Cobol concepts, for example.

Technical excellence has seldom been the key to marketplace success in mainstream commercial data processing. Fourth-generation languages are already technically adequate, but technical merit can't be the main selling point to get that language into the DP shop.

— H. Clark

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"So it's a deal"

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"Sorry. If you want to make your quota, try this: it works every time! Call a third-party maintenance company to handle service. Then keep calling them in the middle of the night to cover for your machines. They'll have to pay our parts counter $250 per part after hours. That'll add up pretty soon."

Economy

the very finest in quality workmanship! Can we make new ideas like collective entrepreneurialism part of the fabric of our corporate life? Do we have the vision and the collective will as a nation to adopt the social and educational programs and reforms that are so desperately needed?

If we do not heed the words of people like John Young and Robert Reich and institute major changes in the way we do business now, our eventual rallying round the flag may be too little too late.

SOFT TALK

Howard Fosdick

VM's coming of age

After a slow start, VM is booming.

While published growth rates for the operating system vary, most analysts place its growth at between 30% and 50% per year. VM will surpass DOS/VSE this year as IBM's most widely installed mainframe operating system.

It's clear that VM has moved out of the backwater and into the mainstream — and this in the operating system that an MVS development group within IBM once recommended against taking to market. (Legend has it that management later noticed that the group used VM for its own software development.) VM is IBM's primary system for office automation, departmental computing, distributed computing and the information center. It is increasingly accepted for business processing, even though it remains weak in transactions processing.

VM's popularity is rooted in its technical strengths. Premier among these is VM's interactive orientation. With its teleprocessing monitor, CMS, VM supports roughly double the number of interactive users

U.S., UK team up for study

Cost-cutting among reasons experts will research software maintenance

BY CHARLES BABCOCK
CW STAFF

ARLINGTON, Va. — U.S. and British experts on software maintenance are planning common methods for surveying managers in software maintenance to collect fresh data on the sparsely researched field.

The information will be fed to a study group at the Center for Software Maintenance at the University of Durham in England, one of the few academic sites devoted to the subject. British Telecom, the UK's largest telephone company, will participate in the survey and co-sponsor it in the U.S.

In the U.S., the Federal Software Management Support Center, a branch of the U.S. General Services Administration in Falls Church, Va., wants to conduct an independent survey that could also produce data for the center. The two parties are defining terms and discussing questions that they agree need to be raised.

Little done in past

Experts on both sides of the Atlantic said there is little research on how to measure program size and complexity, how to measure productivity among maintenance programmers or what diagnostics and tools aid the maintenance effort.

Richard Harrison, director of the Federal Software Management Support Center, said no effective survey has been conducted since the pioneering work of Lientz and Swanson at the University of Southern California, which was published in the early 1980s.

Citing a desire to cut rising maintenance expenses in the federal government, Harrison noted that there are few measures of maintenance programmer productivity or definition of what their problems are.

The Lientz and Swanson studies shed little light on these issues. "Their central conclusion was that we are spending a lot of money on maintenance. Until they did their work, it wasn't largely recognized that maintenance was a necessary func-

Intelligent controller offered

BY ALAN ALPER
CW STAFF

HACKENSACK, N.J. — Sytlogy Corp. is offering an intelligent controller for IBM's OS/VS Cobol compiler that can significantly reduce the CPU cycles consumed in compiling a Cobol application.

The program, called Cobol Express, allows the OS/VS compiler to compile individual changes rather than every instruction in an application. "We provide an intelligent controller for the compiler so it does the minimum amount of work required," noted Stan Rintel, Sytlogy's president and cofounder.

Cobol Express works in parallel with OS/VS, directing the compiler to which instructions need to be updated, Rintel said. "The compiler and Express both reside in the library and work together without modification," he said.

Data View

VAX programming languages

Fortran tops the list as a VAX primary or secondary language

	Primary or secondary language	Primary language

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

ADR extends system to VM

BY ROSEMARY HAMILTON
CW STAFF

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) recently released a version of its change control system that will run in the IBM VM and ISPF environments.

ADR/The Librarian Release 3.7 manages the updates of source code programs in order to reduce programming errors, the vendor said.

By controlling the movement

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Firm develops tools for use with Dibol

Digital Information Systems' DBL Synergy utilities do windows under MS-DOS, VAX/VMS

BY SUZANNE WEIXEL
CW STAFF

RANCHO CORDOVA, Calif. — The first in a series of utilities designed for use with a version of the ANSI-standard Dibol business programming language is now available from Digital Information Systems Corp.

Dibol was developed by Digital Equipment Corp. for use on its VAX computer systems.

DBL is a version of Dibol developed by Digital Information Systems. The DBL Synergy utilities are intended to further enhance the DBL language, the company said.

The first utility in DBL Synergy is a windowing tool that provides the developer with the flexibility to open up to 256 windows on the screen at one time, the company said.

The windowing capability was designed to simplify the display of menus and Help screens and to provide a consistent appearance in applications.

Kevin Curry, a senior programming analyst at Agena Corp. in Columbus, Ohio, said he has used DBL for three years.

"DBL Synergy requires very little code for creating, maintaining and updating windows. It is also portable across the different operating systems we use," Curry noted.

Originally, Curry said, Agena had considered writing its own windowing tool but found that it required too much manpower and too much code.

Digital Information Systems said it intends to add other utilities to DBL Synergy, including an interface to relational data base management systems such as Unify, Inc.'s Unify; a data dictionary; a report generator; and a Make utility.

DBL Synergy is currently available. Prices start at $489 under Microsoft Corp.'s MS-DOS and go to $1,289 on the VAX line.

DBL costs from $589 under MS-DOS to $7,889 on VAX machines, Digital Information Systems said.

A structured language

According to Michele C. Wong, executive vice-president of Digital Information Systems, DBL is more structured than other languages, such as Cobol.

DBL includes structured programming, a debugging facility, program binding, virtual memory, sort and merge statements and multidimensional arrays,

according to Wong.

DBL is also able to compile standard Dibol code, the company said.

DBL, which can be ported to a variety of operating systems including MS-DOS, DEC's VAX/VMS, Unix and Novell, Inc.'s Netware, was originally released 10 years ago, Wong said.

Approximately 15,000 licenses have been sold.

ADR

of source code from test to production environments, the change control system lessens the chances of programmers' reviewing modules in sequential ways or changing modules that have already been updated, according to ADR.

Sharing Librarian production

The system has been offered for IBM's VSE and MVS environments. With the new release, sites will be able to share Librarian master files across IBM operating systems, ADR said.

The additional support of ISPF gives users access to IBM's dialogue management service for the MVS and VM environments.
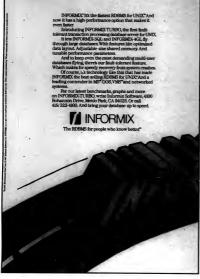
ISPF is most often used by application programmers to develop interactive applications with menus and other end-user facilities.

ADR/The Librarian Release 3.7 includes an updated version of Comparator II, a Librarian component for the MVS environment that allows comparisons of records that are of fixed or variable length, the company said.

Permanent licenses for ADR/The Librarian Release 3.7 are $25,000 for VSE and VM users and $59,900 for MVS users, ADR said.

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(hp) HEWLETT PACKARD

Fosdick

that can be supported by TSO at an MVS site with an equivalent machine.

Unlike TSO, which was added onto a batch processing operating system, CMS was specifically designed for interactive computing. It's widely considered IBM's easiest-to-use mainframe teleprocessing monitor.

CMS also features exceptional software development facilities. The VM/CMS environment can be tailored to the individual programmer's needs, allowing a programmer to request the amount of memory needed, tailor the editor to the task and utilize the terminal as

a virtual operating system console. VM's REXX command procedure language allows the programmer to invoke operating system commands from within a REXX program. The REXX command set is so powerful that it was included in IBM's Systems Application Architecture rather than command languages from the MVS or VSE environments.

In addition to these strengths, programmers may develop code for MVS and VSE systems as well as VM under CMS. And programmers can test code for remote sites on a local host. In an era of distributed computing and decentralized systems, these capabilities give VM/CMS an increasingly critical role.

VM's unique characteristic is its ability to act as a "hypervisor" — an operat-

ing system that runs other operating systems. It achieves this by "virtualizing" computer resources, making it appear to each guest operating system that it alone controls the real computer.

The consistency of several operating systems on a single machine strongly appeals to customers supporting multiple operating systems. One machine supports testing, conversions and reconfiguration of operating systems. Even sites with a single mainframe gain the advantages of diverse operating systems. For example, companies running DOS/VSE under VM reap the interactive benefits of CMS while retaining the production strengths of VSE. VSE is estimated to run at 90% of its capacity under VM vs. stand-alone operation.

Another VM advantage is that it requires fewer systems programmers than other mainframe operating systems. This is critical to the many smaller companies running 4300s and especially the newer 9370s, since these sites can't afford systems expertise. As VM has achieved market success, IBM has adapted its software strategies accordingly. First, one should recognize that IBM has propagated VM/CMS across its computers.

The presence of a single CMS monitor across machines of different sizes also means that programs and programmer skills are transferable.

VM/CMS represents IBM's answer to critics who begrudge the company its diverse hardware and software offerings. While DEC runs a single operating system on all its machines, smallest through largest, IBM can now make that same claim. And while Unix aficionados claim applications portability and skills transferability across machines of any size, IBM matches that claim through CMS.

Fosdick is an industry analyst in Villa Park, Ill., and author of VM/CMS Handbook for Programmers, Users and Managers.

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U.S., UK study

tion," Harrison said.

The federal Office of Management and Budget (OMB), attempting to put a lid on rising maintenance costs, issued a directive in July 1986 that maintenance expenses were to be cut 25% during the next three years.

The author of the directive, Franklin S. Reeder, attended the Data Processing Management Association's conference two weeks ago and answered, "We don't know," when asked how OMB planned to measure whether software maintenance groups were living up to the directive.

'Little desire to analyze'

"In federal systems, it has not been difficult to generate money for new systems. There's been little desire to analyze what's wrong with existing systems and squeeze more productivity out of them," Harrison noted.

"We know we're spending a lot of money on maintenance. We don't know where it's going exactly," said John Foster, head of the software engineering applications group for British Telecom.

Harrison, Foster, Mel A. Colter, a software maintenance author and consultant with Colter Enterprises, Inc., in Monument, Colo., and Keith Bennett, director of computer science at the University of Durham, are working together to hammer out common definitions and approaches for a survey on each side of the Atlantic. They do not plan to exactly the same questionnaire. Rather, they want to collect data that both sides can agree that they know what it means.

The group is seeking commercial companies in the U.S. and UK that wish to participate in the survey. Anyone interested should contact Foster at British Telecom, Research Laboratories, Martlesham Heath, Ipswich IP5 7RE.

The surveys on maintenance are also being advocated by Colter, who gave the keynote address at the DPMA's 5th annual conference last month.

Intelligent

Since compiling can consume about 20% of a CPU's capacity, a large reduction in compile time, such as the 75% reported by one Cobol Express user, may boost effective machine capacity by 15%, Rintel said.

The product operates on any IBM mainframe or equivalent running IBM's MVS/370, MVS/XA or VM/CMS operating systems. It supports all Cobol preprocessors, such as CICS, postprocessors, such as Computer Associates International, Inc.'s CA-Optimizer; and source code storage products, such as Panoptic Software, Inc.'s Panvalet and Applied Data Research, Inc.'s Librarian. Cobol Express is priced at $3,200 per processor per year for a three-year license.

Cobol Express has already been installed at 10 sites, Rintel said, including Bank Leumi Trust Co. of New York and Reader's Digest Association, Inc. in Pleasantville, N.Y. Installations using Cobol Express have projected cost savings of between $65,000 and $210,000, depending on the extent of Cobol development and maintenance and internal chargeback rates, Syllogy said.

Bank Leumi is using Cobol Express with its IBM 4341 Group 2 running under MVS/SP. The system is used primarily for development, so a good deal of CPU resources are consumed by recompiling as programmers test their code, noted Harry Adler, project manager in charge of operating systems.

Before Cobol Express was installed, compiling used 55.3% of computer time, 61% of execute channel programs — better known as I/Os — and 55% of service units. When using Cobol Express, there was a 72% improvement in computer time, a 73% reduction in execute channel programs and a 67.5% savings in service units, Bank Leumi reported. Cobol programs with 20,000 to 30,000 lines are now done in 20 minutes, down from almost two hours previously.

'Helps a great deal'

"With all the compiles we do, cutting down the time to 20 minutes helps us a great deal," Adler asserted. "If a person has a problem, he fixes it and recompiles quickly. It doesn't lock out the rest of people who need to do recompiles."

Sal Contuono, assistant director of data processing technical services at Reader's Digest, has been using Cobol Express on the firm's IBM 3090 Model 400E running MVS/XA for the last year. The firm runs about 1,000 batch jobs daily to update customer files, he said. Cobol Express produced savings when compiling for the first time as well as in recompiling, with gains of 40% to 80%, Contuono said. "When you recompile, it ranged from 40% to 80% savings; you're talking about an average of a 58% reduction in computer resources," he said.

Currently, Cobol Express does not support VS Cobol II — IBM's latest Cobol compiler — although Syllogy's Rintel said he is negotiating with IBM to license the source code. The problem, Rintel pointed out, is IBM's policy of providing only object code to independent companies. "They have to determine the value of the code and make a procedural change," Rintel said. "So far, they've said yes, that it makes sense for both companies."

OA tools aimed at Prelude 4GL

BY SUZANNE WEIXEL
CW STAFF

CAMBRIDGE, Mass. — Venturcom, Inc. introduced a set of office automation productivity tools for use with its Prelude fourth-generation language and relational data base management system.

According to a company spokesman, the Prelude Office Information System allows office automation applications to be developed with a common user interface. It can also extend the interface across existing third-party applications.

Designed as a series of integrated modules, the applications available include spreadsheets, graphics, word processing, calendar and project management. All modules use a common set of menus, screen formats and keystrokes. The modules can also work independently, the vendor said.

The Office Information System supports data transfer between applications, electronic mail between users, multitasking and user customization. Screen layouts are uniformly based around a Lotus Development, Inc. 1-2-3-type menu, and context-sensitive help and error indicators appear as pop-up windows within an application.

The Prelude fourth-generation language development facility contains a forms builder and report writer as well as a screenshell and a data manipulation language. The Prelude relational data base maintains concurrency control and supports administrative tasks in addition to providing access to data base tables.

The Prelude Office Information System, priced at $1,995, is currently available on the IBM Personal Computer AT and compatibles and the AT&T 3B line of computers, the vendor said.

Prelude runs under Unix System V or Venturcom's Venix, a version of the standard Unix System V. Venix costs from $400 on a PC AT to $15,800 on a Digital Equipment Corp. VAX 8600. Prelude has an installed base of more than 3,000 units, the vendor said.

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Applications packages

Interleaf, Inc. has announced a reconfiguration of its TPS publishing software into a core text-and-graphics product and two sets of bundled options.

TPS provides word processing, automatic page layout, graphics and imaging and long-document management capabilities. The core version was designed as a networked product.

The advanced graphics option provides diagramming capabilities such as isometric conversions and line-art imaging. The document management option produces long, multichapter documents.

TPS runs on workstations from IBM; Apollo Computer, Inc.; Digital Equipment Corp.; and Sun Microsystems, Inc. as well as on Apple Computer, Inc.'s Macintosh II.

TPS costs $12,500. Core TPS costs $6,500. The options cost $4,000 each.

Interleaf, Ten Canal Park, Cambridge, Mass. 02141. 617-577-9800.

Utilities

A support package for running AT&T's Ditroff software under the Digital Equipment Corp. VAX/VMS operating system

has been announced by Talaris Systems, Inc.

The package, called **Ditroff-Support-VMS,** lets VAX/VMS users print documents typeset using Ditroff on Talaris Qlar-based laser printers. It includes the Ditroff software, sublicensed from AT&T; the Documentor's Workbench; 120 Ditroff fonts in portrait and landscape orientation; and documentation.

Ditroff-Support-VMS is priced at $1,950.

Talaris Systems, P.O. Box 261580, San Diego, Calif. 92126. 619-587-0787.

Services

A disaster recovery planning guide called Contingency Planning Strate-

gies/90 has been announced by Contingency Planning Research, Inc.

The guide is said to provide the information necessary for companies to develop business resumption plans. It includes document restoration strategies, hot-site locations, planning for the loss of employees, data center relocation planning and simulation strategies.

Contingency Planning Strategies/90 is intended for sites that use systems like IBM's System/38, 9370, 4300 and 3000; Data General Corp.'s MV series; Digital Equipment Corp.'s VAX; Unisys Corp. systems; Wang Laboratories, Inc.'s VS/7100; and the NCR Corp. 9000. The guide costs $125 per copy.

Contingency Planning Research, P.O. Box 568, Glenwood Landing, N.Y. 11547. 516-754-7087.

NEW AT DEXPO WEST '87

Quantum PM, real-time performance-monitoring software for Digital Equipment Corp. VAX systems, was announced by **Computer Information Systems, Inc.**

Quantum PM is said to collect and report configuration, CPU, I/O and memory statistics for performance analysis, system tuning and capacity planning. It collects statistics directly from DEC's VMS. According to the vendor, the system manager can define, adjust, modify and delete statistic groups used in collecting and reporting data.

Pricing ranges from $1,000 to $54,000, depending on system configuration. Computer Information Systems, 165 Bay State Drive, Braintree, Mass. 02184. 617-848-7515.

MCBA, Inc. released its **Labor Performance** software package for VAX computers.

Part of MCBA's Manufacturing System in VAX Cobol, the package supports clock-card entry and editing. Other features include the ability to use files created by data terminals; analyze performance productivity; support reporting by department crew or work center; centralize labor transaction entry; support an incentive system; support multiple components; and interface with other packages in MCBA's Manufacturing System.

The Labor Performance package costs from $4,000 to $7,500. MCBA, 425 W. Broadway, Glendale, Calif. 91204. 818-242-9600.

Pacerware is a software package that enables VAX/VMS system to function as an Apple Computer, Inc. AppleShare-compatible file server, was introduced by **Pacer Software, Inc.**

The software implements the Apple Filing Protocol on a VAX system, enabling the VAX to act as a large file server for an Apple Macintosh network. The Macintosh mouse and graphics interface can be used to peruse the VMS file system, create directories, move directory trees or access any VME file type from within a standard Macintosh application.

Pacerware requires Pacer's PClink communication software installed on the VAX. The Macintoshes must be connected via Ethernet.

Supporting five concurrent users on a DEC Microvax, PClink costs $2,000, and Pacerware costs $400. Pacer, Suite 402, 7911 Herschel Ave., La Jolla, Calif. 92037. 619-454-0565.

MICROCOMPUTING

MICRO BITS

Douglas Barney

No Dbase IV for Christmas

Hold that check. It's going to be a lonely Christmas for Ashton-Tate's Glendale, Calif.-based

Dbase IV development team. It seems that Ashton-Tate management offered the team a bonus totaling $2 million — if it could polish up Dbase IV and get it to market before the end of the year. According to an Ashton-Tate source, the team only made it to an alpha-test version, so no $2 million. Anybody want to assume payments on an almost-new Porsche?

This is **D**basically ill. Users interested in the still-unfinished Dbase IV can catch a glimpse of the alpha-test version at the Dec. 15 meeting of the Dbase Special Interest Group of the Boston Computer Society, a Dbased source said recently.

You're **D**basically hired. Ashton-Tate has added Moshe M. Zfool to its development staff as senior scientist in charge of software development. Zfool will be responsible for advanced user interfaces for data base applications development.

According to Ashton-Tate,

Buyers skirt clone service woes

Users discover imaginative ways to support low-cost units

BY ALAN J. RYAN
CW STAFF

Once snubbed by big businesses, low-priced IBM Personal Computer clones are making their way onto corporate America's desk tops with the help of some innovative approaches to service.

While many business buyers now publicly boast of purchasing two clones for the price of one IBM or Compaq Computer Corp. machine, they also point out that there is a trade-off in availability and ease of service. However, new service programs are softening some of their apprehensions.

The manager of end-user support at a major oil company said his firm has purchased approximately 280 PC's Limited personal computers from Dell Computer Corp. in Austin, Texas, at a savings of 40% over comparably equipped IBM offerings. Honeywell Bull, Inc. representatives serve the clients.

Carol Kellogg, assistant vice-president of marketing systems at Moxy Financial Services Co. in Teaneck, N.J., said she is recommending a low-profile clone to her company's 3,000 field sales representatives.

According to Kellogg, the vendor has agreed to pay for any shipping if the units break down in the first 30 days and issued a 30-day money-back guarantee as well as a one-year warranty on all parts and labor.

Firestone Tire & Rubber Co. in Akron, Ohio, has standardized on both Zenith Data Systems PCs and various models of IBM's Personal System/2. Selected for their low price, the Zenith units are repaired in-house.

Rick Frye, manager of research and development at Carolina Freight Corp. in Cherryville, N.C., said his company has purchased more than 60 Everex Systems, Inc. System 1800 clones that he claimed are both cost-effective and reliable. If there is a problem, the unit is fixed on-site by Carolina Freight technicians.

All four users said price was the most important factor in their decision to buy clones. But there are some concessions to be made.

Low-end clone makers (who prefer to be called compatible makers) generally do not offer on-site service contracts. While most offer toll-free service lines, only the most persistent callers ever get through.

Users with problems face

Data View

Color output

Users' purchase plans for the next two years, based on 1,296 respondents

4.2%

Definitely will buy
Probably will buy

Definitely will not buy
Probably will not buy

INFORMATION PROVIDED BY CAP INTERNATIONAL, INC.
CW CHART

Bricklin enhances prototype developer

BY ED SCANNELL
CW STAFF

NEWTON, Mass. — Dan Bricklin, president of Software Garden, Inc. and creator of Visicalc, last week shipped the follow-up to his Demo Program, which allows both experienced and novice corporate developers to create program prototypes.

Appropriately called Demo II program, the enhanced product now includes the ability to capture bit-mapped graphics from other programs, a run facility containing more than 100 ac-

tions to execute and both string and numeric variables.

Demo II, which contains the runtime version, costs $195 and comes with a license to make an unlimited number of copies of the runtime version. Bricklin said the original program, priced at $74.95, will continue to be available.

The new version also contains a significantly updated user manual along with templates, an on-line tutorial and sample files, and a full-prompted programming language, Bricklin said.

"The Data General
difference:
my best investment
protection."

SMALL
TALK

William Zachmann

Modems' little helper

For some reason, personal computer communications software has always been a little intimidating to me. Although I have a fairly extensive data communications background, I never really feel that I've got things in hand when it comes to modem communications.

Of course, nearly every modern communications package works fine — when it works fine. That's just it; something's always going wrong. For instance, logging on to a new service just doesn't seem to work right. The modem that has always worked fine suddenly can't seem to recognize a carrier tone at 2,400 bit/sec.

That's when the trouble starts. Figuring out what isn't working, why and what to do to fix it is never easy. With different modem settings, data transfer protocols, terminal emulation modes and other variables to choose from, there are lots of ways to go wrong.

As if that weren't bad enough, nearly every modem communications software package ends up making matters even more difficult. All the popular data communications programs seem to have come up with some pretty mysterious ways of doing at least some of the things you need to get done.

Continued on page 40

DOS Merge 286 hits the road

Although price is right, limitations, complexity dissuade some

BY JULIE PITTA
CW STAFF

SCOTTS VALLEY, Calif. — The ability to combine Microsoft Corp. MS-DOS and Unix capabilities in one system has users looking to software packages like DOS Merge 286, a joint development product from Microport Systems, Inc. and Locus Computing Corp.

"It has the potential to be the wave of the future," said Paul Cubbage, an industry analyst at Dataquest, Inc. "The average computer user wants multitasking and access to all the system's memory. Combining DOS and Unix allows that."

At $149, DOS Merge 286, which began shipping in September, should prove inexpensive enough for most users. Although the price is right, DOS Merge 286 may dissuade some because of its limitations. Only one DOS program can run under DOS Merge 286 at a time because of the limitations imposed by the architecture of its Intel Corp. 80286 chip.

Additionally, it may be unsuitable for the average personal computer user because of the complexity inherent in Unix and the difficulty users may experience in switching between the two operating systems.

Like having OS/2

Web DOS Merge 286, files are stored on a single file system and may be accessed from either DOS or Unix. Microport said users are able to switch between DOS and Unix by pressing a hot key.

Microport has billed DOS Merge 286 as a package that gives PC users "the advantages of OS/2 now," referring to the operating system that is currently under development by Microsoft and IBM.

An Intel 80386 version of the software, which was also jointly developed by Locus and Microport, is currently being beta tested.

Ronald Bolin, staff manager for Southern Bell Telephone and Telegraph Co.'s network department, said his department has purchased DOS Merge 286 but has opted not to use the package because of its inability to run DOS-based communications software reliably.

Not easy to use

"It's satisfactory with most DOS applications," Bolin said, "but it's unusable in serial communications. It misses characters." He added, however, that data can be transmitted in Unix mode.

Without a good working knowledge of both DOS and Unix, using DOS Merge 286 could prove difficult, users said.

"To go from just using DOS to using Unix represents a pretty healthy learning curve," admitted Dave Grana, a consultant for Acrosystems Corp., a Beverly, Mass.-based manufacturer of data acquisition systems.

Acro is using DOS Merge 286

for software development, Grana said. Using the package, users can take advantage of Unix's more powerful software development tools when working on DOS applications.

'Best of both worlds'

"It kind of gives me the best of both worlds," Grana explained. "But it could be improved. Some programs work better from Unix than others. Some don't allow input and output to be redirected."

Dataquest's Cubbage said he found the product's user interface is unwieldy. "For PC users, it has been kind of complex and difficult to use," he maintained.

"The implementation of the user interface is clumsy and complex. It requires much more knowledge of the computer system than the average user has. The average user doesn't do many operating system commands," Cubbage said.

Despite its limitations, DOS Merge 286 may provide users with an inexpensive solution to the DOS-Unix dilemma.

"There's a lot of acceptance for this kind of approach," Cubbage maintained. "Hopefully, they'll work out some of the problems on future versions."

PC videotape training lauded as more effective

BY DOUGLAS BARNEY
CW STAFF

Microcomputers do not do anything unless someone knows how to use them. But if Learn-PC Video Systems, along with a host of other video-based training firms, has its way, the lack of end-user knowledge will cease to be a problem.

Frances Mendelsohn, information center manager for the Food and Drug Administration, said she believes video is superior to built-in tutorials when it comes to training users. Among the many training products used by Mendelsohn are Learn-PC's videos on Microsoft Corp.'s MS-DOS, Ashton-Tate Corp.'s Dbase and Lotus Development Corp.'s 1-2-3.

"Different packages have their own training that comes bundled, but we find you get better training if you take someone else's course," Mendelsohn said. "You can cheat with some of the other systems."

According to Mendelsohn, with built-in tutorials all a user has to do is figure out the sequence or pattern of answers to complete the lesson.

Live presentation needed

With Learn-PC, Mendelsohn runs the video tape, pauses the tape to go over the material covered and allows the class to repeat what it has learned. It takes more than just a tape to get people trained. "I lecture and fill in little gaps. I find these tapes need a live person. People are going to get stuck, and watching the tape 10 times isn't going to

get them unstuck," Mendelsohn explained. Mendelsohn also occasionally lends the tapes to users to view at home.

What is the alternative to video-based training for Mendelsohn? Without it, "it would be much more difficult and much more expensive. You would have two choices: not to train, or hire contractors to do it," she said. "This is a cost-effective way to get a lot of people trained."

Learn-PC, based in Minneapolis, offers tapes that cost from $495 to $1045.

Despite quirks, Wang laptop suits users' needs

BY ALAN J. RYAN
CW STAFF

Wang Laboratories, Inc.'s year-old Laptop Computer certainly has problems users say should be corrected, including a hard-to-read LCD screen, a short battery life and a slow built-in printer.

Nonetheless, users interviewed by *Computerworld* recently said the product's overall performance meets their needs.

"The laptop did everything we expected it to do, but there were a few quirks," said Victor Emmauel, a distributed support analyst at American Family Mutual Insurance Co. in Madison, Wis.

Emmauel said the laptop's poor print quality makes it useful for printing rough drafts only and that it offers only 10- and 17.5-pitch printout. "I wanted to get a 12-pitch . . . most applications on the [Wang] VS print out in 12-pitch. But the smaller pitch wasn't available at this time," he added. "But the concept of the printer is good, especially since it still kept the portable under 15 pounds."

A Wang spokesman said the company has always indicated that the printer will not deliver letter quality but that the user has the option of attaching a letter-quality printer to the laptop's RS-232C port.

User's have also cited the laptop's short battery life as a problem. "The battery life is only four hours — and possibly less, if the user is accessing the Winchester or doing printing," said David Hostetler, manager of microcomputer systems at the law

Laptop Computer	
Price: $3,500	

- Intel 8086-compatible CMOS processor
- 8-MHz speed
- 16-bit architecture
- MS-DOS 3.2
- 512K-byte memory expandable to 1M byte
- Supertwist monochrome LCD with built-in parallel port
- Epson MX-80-compatible printer operating at 18 char/sec. in burst mode
- Full-size 82-key keyboard with Wang/IBM legends

firm of Jones, Day, Reavis & Pogue in Cleveland. He added that many laptops have a battery life of 15 to 20 hours.

Wang said a new release of Microsoft Corp.'s MS-DOS due in the first part of next year will enhance the utilities that handle disk access, thus taxing the battery power less than it has been.

"During operation, the user will be able to have a quiet drive," the Wang spokesman said. However, he added, "it will still be a four-hour battery life." Users can purchase additional rechargeable battery packs.

While users also complained of a hard-to-read LCD screen, Wang said it currently has no plans to address that problem.

"In the near future, possibly early next year, there will be a cable connection allowing an external color monitor to be attached to the laptop for higher resolution capability," the company spokesman said. But the

LCD screen will remain the only screen available for portable use, he added.

Emmauel also noted that while the Wang laptop has a standard internal half-height Winchester disk drive, the user must attach either an external 3½- or 5¼-in. disk drive to load software, which he found cumbersome.

The real advantage of the computer, users said, is that it is compatible with Wang's VS.

Hostetler said 15 of the law firm's attorneys are using the portables and that he will likely purchase more. The Wang laptop's word-processing advantages make it more appealing to the attorneys, he added.

"Right now, we are trying to standardize and look at compatibility issues with our current [Wang] configurations," Hostetler said. "We want a laptop that is going to meet these needs."

Barney

Zicof created and developed IBM's Query-by-Example, the same interface that Ansa Software (developer of Paradox) used to attack the procedural language-based Dbase.

Zicof joins the all-star development team of Olam, Wong and Benson, all of whom switched from large-systems software and joined Ashton-Tate to work on micros.

Oh no you don't. Like those of most language vendors, Microsoft's products are restricted by the 640K-byte limit of the firm's MS-DOS, and programmers cannot easily develop big applications. As a result, a sharp but perhaps overly ambitious, proposal came from the Microsoft languages group to develop languages that can switch from the 640K-byte-bound real mode to the 16M-byte-bound protected mode of the Intel

80286 microprocessor.

But according to sources, IBM nixed the idea because of concerns that these languages would cut into the demand for the large-memory OS/2 operating system.

No more blank spreadsheets. If Lotus's Information Systems Division has its way, no one will ever have to key in spreadsheet data again — well, almost. According to Don McLagan, division vice-president and general manager, the division's ultimate aim is to provide a series of products that contain reams of data, both numeric and textual, on an array of media such as compact disk/read-only memory (CD-ROM), real-time data feeds and magnetic media. Through improved interfaces and querying tools, a user would be able to intuitively request a particular piece of data, which would arrive quickly, no matter where it might reside.

While Lotus isn't promising this level of product anytime in the near future, McLagan says he believes that the firm has most of the pieces in place to get the job done. They've got the real time, the CD-ROM and the retrieval software. A lot of the work is just putting all this stuff together cohesively.

AI SQL? One source speculated that there may be a connection between Lotus's Lotus/DBMS, and Arity Corp., a firm in which Lotus has invested and which provides Prolog products that

work with SQL. A Lotus official declined to comment.

SAA it ain't. An indignant supporter of the old character-mode interface told us recently that although Microsoft is pushing the Presentation Manager as the epitome of the IBM Systems Application Architecture (SAA) user interface, there is a character-mode subset that also conforms to SAA. While the character-mode proponent advocates graphics interfaces for those who desire them, he says you don't need a mouse and IBM's Enhanced Graphics Adapter to get into the SAA swing.

Barney is a Computerworld *senior editor, microcomputing.*

Zachmann

Hayes Microcomputer Products, Inc.'s recently introduced Smartcom III, with a $249 list price, proves to be an exception to the general obscurity of modem communications software. A completely redone product for IBM and compatible systems with minimal resemblance to Hayes' earlier Smartcom II and with a comprehensible interface, Smartcom III goes a long way toward making it easy for users to understand. A very clean menu structure, liberally supplemented with extensive context-sensitive Help files, is a big part of that effort.

But all this makes for a pretty good-size program. Smartcom III needs at least a 512K-byte system and takes up nearly 1.5M bytes on a hard disk. However, I don't see that the size makes much difference unless you are running on a system without much disk or memory.

The program also requires a Hayes or highly Hayes-compatible modem. Some modems advertised as "Hayes compatible" really aren't, and they won't work well — if at all — with Smartcom III. Still, I see no reason to blame Hayes for the deficiencies of some modem vendors' compatibility claims. Many modems work fine with Smartcom III.

Nearly every communications program divides up the communications task differently. Smartcom III approaches it in terms of activities, connections, scripts and macros. Connections include things like communications speed and parity.

Activities are defined in terms of what goes on at the personal computer, including things like file-transfer methods used and control of the screen display.

By distinguishing activities from connections, Smartcom III makes it possible to easily set up more than one connection for the same activity. For example, an activity created for calling up one's electronic mail could use different connections, depending on where the call is being made or at what modem speed.

Out of the dozens of programs that I look over, very few find a place on my C disk. Smartcom III is one of those.

Zachmann is vice-president of research at International Data Corp.

PC users never have to leave their PC application

How to get your PCs on speaking

You've got a lot invested in the many elements of your Data Processing operation. Mainframe applications programs. PC software applications. And the necessary micro-mainframe links. But your PCs and mainframe still aren't talking the same language.

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Your end-users wait for special requests to be processed. Then they perform the time-consuming task of re-keying data, inviting human error. And, even if your PCs are linked, end-users must leave their favorite PC programs to work with micro-mainframe links and mainframe query languages. Another stumbling block in the path of creating a smooth exchange of information.

The Application Connection® (T-A-C) from Lotus® is a mainframe and micro software product that lets you realize your investments in mainframe applications, micro-mainframe links and PC applications by connecting them for a fast, secure, uncomplicated exchange of information.

COMPUTERWORLD

Clones

quently resort to mailing the computer back to the vendor, a process that usually takes more than a month. Most compatible vendors offer some type of warranty on parts, averaging from 12 to 18 months.

Do the cost savings outweigh the potential problems? User opinions vary.

"With the lid off, all better clones are the same," Mony's Kellogg said. She added that when she tested several clones against an IBM PC AT, the clones had to run all of the software used by the company's insurance agents in the field and had to include a Phoenix Technologies Ltd.

BIOS and a Chips and Technologies, Inc. chip set. A brand name on the box adds little but cost to the computer, she said. Mony selected the Bestron PC, which is manufactured in Taiwan.

Carolina Freight's Frye said he also looks for the Phoenix BIOS and that he will not buy hard drive units unless they have Seagate Technology, Inc. drives. "If I get these components, the name of the vendor doesn't really matter," he said. "I know I've got a reliable box."

Higher 'infant mortality'

The oil company spokesman said his clones are less reliable than the high-end microcomputers, though they make up for that flaw in cost savings. "In long-term reliability, once the machine has

been up and running for months, I don't think it fails any more than an IBM or Compaq," he said. "But we have found that the 'infant mortality' is much higher," with the clones having a failure rate five times higher than that of the high-end machines in the first 30 days, he added.

Brian Camenker, a senior systems analyst with Dynamics Research Corp. in Wilmington, Mass., said the different departments within his company buy many types of personal computers and that not all of them are reliable.

"It's a trade-off," Camenker said. "The users go for a low price, but they take a chance on the support being marginal. . . . The lower priced ones are the ones most prone to screw up."

PC's Limited provides the oil company

with a one-year warranty with service provided by Honeywell Bull. Users with problems must first call PC's Limited to see if the problem can be resolved over the phone. If not, they call in the Honeywell Bull representative. The computers are sold largely through phone sales.

Users of Delta Computer Corp. machines, which are also manufactured in Asia, can expect a one-year parts and labor warranty, a toll-free line for technical assistance and dealer support. The units, if they fail, are repaired or replaced by a third-party contractor or by Delta itself, according to a spokesman.

Some large end-user companies skirt the often-busy toll-free user service hot lines offered by vendors by providing their own in-house service centers.

Ed Shaffer, a buyer at Firestone, said the company sent its technicians to the Zenith training school to learn how to repair the computers in-house. "We are our own authorized Zenith repair center," he said.

Carolina Freight's Frye said that when his technicians need to repair a clone, they remove the malfunctioning board and replace it. Frye said the ability to repair the units internally, avoiding costly service contracts, weighed heavily on his decision to buy the clones.

For Joseph Ginnelli, vice-president of MIS at Toys R Us, Inc. headquarters in Rochelle Park, N.J., service was one reason he decided to stay with his more expensive NCR Corp. equipment than abandoning on clones.

"We got a big discount from NCR because we're big users of NCR's point-of-sale systems," he explained. Ginnelli said the company also has purchased some PC's Limited machines. "We last even fooled around with building our own PCs, but it wasn't worth the effort."

Bricklin

Bricklin, president of the two-person Software Garden, said he spent 18 months designing and implementing Demo II. He said the program includes about 75 features that were not in the original program. "I managed to get about 95% of the changes in that customers were looking for," Bricklin said.

Between 15,000 and 20,000 copies of the original Demo program have been sold direct from Bricklin's Newton home and through selected retailers such as Egghead Discount Software, Inc. and Softsel Computer Products, Inc., an Inglewood, Calif.-based distributor, he said.

Several major software developers have used the product to create products, including Microsoft Corp., which sold the program to develop its best-selling integrated program, Microsoft Works.

Bricklin introduced Demo II at a Capital PC User Group meeting in Washington, D.C., last week in a nonpareil fashion. "With a program that can be used to create vaporware, you get very picky about actually shipping before announcing," Bricklin said.

He then brought a Federal Express courier onstage, who carried off the first boxes of the completed product to Softsel for distribution to its dealers. "I can now announce the product," Bricklin said.

Users of the original program can upgrade for $54.95. Bricklin said he will primarily handle the user upgrades himself.

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So, if you find that the number of end-user requests you are faced with is growing, but your return on DP investment is not, T-A-C from Lotus can help you get your PCs speaking terms with your mainframe.

To receive more information about T-A-C, call Lotus at 1-800-345-1043 and ask for product CD-2540.

Lotus T-A-C

Lotus The Application Connection

Rational's C tool cracks MS-DOS limit

BY DOUGLAS BARNEY
CW STAFF

NATICK, Mass. — C programmers can break through the 640K-byte barrier in Microsoft Corp.'s MS-DOS with the help of Rational Systems, Inc.'s $795 Instant-C/16M.

Instant-C/16M is an interactive C development tool aimed at helping programmers write large applications, the company said. It is slated to ship next month.

The product, which runs under MS-DOS, takes advantage of the protected mode and large memory capabilities of Intel Corp. 80286 and 80386 chips. With Instant-C, programmers can address up to 16M bytes of memory, according to Rational. Still, programs that are developed are intended mainly for the 640K-byte MS-DOS environment.

Because Instant-C/16M resides in memory above the first megabyte, it leaves room to run a personal computer application like Lotus Development Corp.'s 1-2-3 while the compiler is working, said Terence M. Colligan, president of Rational.

Incremental compiler

Instant-C is a so-called incremental compiler. It speeds compilation by reprocessing only the portions of a program that have been modified.

Instant-C supports Borland International's Turbo C, Lattice, Inc.'s 3.20 compiler and Microsoft's C Version 5.0. The product requires an IBM or compatible 80286- or 80386-based machine running MS-DOS.

Although Instant-C/16M does not allow programmers to develop applications for IBM and Microsoft's OS/2, it does give them OS/2-class memory capabilities, Rational said.

And, according to Colligan, there are currently no incremental C compilers or interpreters for OS/2. The situation should change next spring, when Rational is scheduled to ship an OS/2 version of Instant-C.

Hyundai 286-based file server debuts

SANTA CLARA, Calif. — Hyundai Electronics America recently introduced an Intel Corp. 80286-based file server that can double as a stand-alone workstation.

Called the Super-286, the Hyundai system offers 12 slots: six each for 16- and 8-bit expansion boards.

Additionally, it accommodates five half-height Winchester disk drives in capacities of 20M to 70M bytes of fixed or removable storage.

The Super-286 offers clock speeds of 8 or 10 MHz and 1M byte of random-access memory,

the vendor said.
The server costs $1,999 without a monitor.

The new system is the third personal computer product Hyundai has released since launching its U.S. marketing effort in August. Hyundai also offers an IBM Personal Computer

AT-compatible machine and an Intel 8088-based microcomputer.

A company representative said Hyundai expects to introduce an Intel 80386-based system during the first quarter of next year.

Hyundai has signed 185 independent dealers and 41 value-added resellers to sell its products.

NEW PRODUCTS

Systems

The Darwin-386, a microcomputer configured with a 70M-byte hard disk, a keyboard and 1M byte of random-access memory, has been introduced by PC Genius, Inc.

Other features of the computer include two serial, two parallel and one game port, a system clock, hardware reset, a turbo LED indicator and a disk-access light. It operates at 12 and 16 MHz at zero-wait states and uses Award Software, Inc.'s 386 BIOS.

The Darwin-386 comes standard with a monochrome monitor. It is priced at $2,995.

PC Genius, 100 A Tower Office Park, Woburn, Mass. 617-933-8442.

Software applications

Data entry software said to emulate operational features of the IBM 3742 and 3741 keypunches has been introduced by Numenor Microsystems.

The product, DEPC, features edit rulers, automatic reproduction templates and batch verify functions. Once data is input, it is stored on a diskette and may be uploaded to a host using third-party file transfer software.

Other features include a software-customized keyboard, automatic numeric checks, automatic duplication options, a keys-pressed-per-minute indicator and a record counter.

DEPC costs $49. An unlimited-copy site license costs $190.

Numenor Microsystems, 69 Summerhill Ave., Toronto, Ont., Canada M4T 1A9. 416-925-4700.

An integrated desktop presentation system for use with Apple Computer, Inc. Macintosh II personal computers has been announced by Cricket Software.

Cricket Presents features text-handling capabilities such as justification, tabbing, indentation, margins, advanced tabbing and a set of drawing tools. Users can customize font size, style and color and can incorporate shapes in the creation of graphs, charts and tables.

Scanned images and graphics can be imported from any standard PICT format or graphics PICT format, including Cricket Draw, Cricket Graph, Pict-O-Graph and Apple's Macpaint and Macdraw.

Cricket Presents costs $495.

Cricket Software, Great Valley Corporate Center, 30 Valley Stream Pkwy., Malvern, Pa. 19355. 215-251-9890.

Languages

An Intel Corp. 80386 compiler called NDP Fortran-386 has been announced by Microway, Inc.

According to the vendor, code generated by NDP Fortran-386 and executed using Microway's 80386 numeric co-processor, MW1167, runs 16 times faster than on an IBM Personal Computer AT with an Intel 80287 processor.

The speed of execution, the vendor said, is a result of the use of 32-bit mainframe compiler technology that includes global optimization and register utilization. NDP Fortran-386 generates native 80386 code that runs in protected mode under Microsoft Corp.'s MS-DOS or Unix V. The addressable memory available in the linear address mode is 4G bytes.

The NDP Fortran-386 compiler costs $595.

Microway, P.O. Box 79, Kingston, Mass. 02364. 617-746-7341.

Digital
has
it
now.

Software utilities

Central Coast Software has announced **Precisely**, a "what-you-see-is-what-you-get" word processor, and **Quarterback**, a hard-to-floppy-disk backup utility. Both were designed for the Commodore Business Machines, Inc. Amiga series of personal computers.

Precisely supports multitasking, multiple windows, keyboard macros, on-line Help and column cut and paste.

Quarterback is said to be capable of transferring 20M bytes to floppy disk in 45 minutes. It supports full, subdirectory or incremental backup and restore with automatic formatting of diskettes, cataloging of files and diskette sequence numbering and checking.

Precisely costs $79.95. Quarterback costs $69.95. Shipping costs an additional $3.

Central Coast Software, 268 Bowie Drive, Los Osos, Calif. 93402. 805-528-4906.

Development tools

Intermec Corp. has introduced a personal computer-based program development system using its Interactive Reader Language (IRL).

IRL is a programming language designed specifically for data collection. It features data editing and record look-up commands for portable bar code reading and on-the-spot verification. The pro-

gram development system, called PC-IRL, includes a page editor, a compiler and a debugger with a reader display emulator.

According to the vendor, IRL programs can be stored on disk or transferred between the PC and any IRL reader.

PC-IRL costs $495.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynnwood, Wash. 98046. 206-348-2600.

Software enhancements

Version 5.00 of the **Applications Communication Control System** (Access) software library has been released

by Trilobyte Software Systems.

Designed for use in the IBM PC-DOS environment, Access is said to integrate program development, system security, data communications and application support. Features include a screen map generator for painting and calling custom screens with data fields, support for 50 function keys, support for remote access, file transfer with error checking and asynchronous control routines.

Access Version 5.00 costs $245.

Trilobyte, 295 Los Angeles Blvd., San Anselmo, Calif. 94960. 415-457-3431.

Data storage

A 5¼-in. enhanced small device controlled Winchester subsystem for IBM Personal Computer ATs and compatibles has been announced by PMC Associates.

The subsystem, called the ESDX-PC, comes with one or two removable drives featuring average access times of 16.5 msec and data transfer rates of 1.86M byte/sec. The single-slot controller supports up to four drives.

Other features include switch-selected direct-memory access, port addressing interrupts and 32-bit error detection control with 11-bit error correction control. It is compatible with Microsoft Corp.'s MS-DOS and Xenix, IBM's PC-DOS and AIX and local-area networks from IBM, 3Com Corp., Novell, Inc., Orchid Technology, Inc. and Ungermann-Bass, Inc.

Pricing starts at $5,566.

PMC Associates, 74 North Central Ave., Ramsey, N.J. 07446. 201-934-1835.

Printers/Plotters/Peripherals

The **Macfactory-ST3** product line, designed to link data collection devices, bar code readers, robots and programmable logic controllers to Apple Computer, Inc. Macintosh personal computers, has been announced by Synaptic Technologies, Inc.

According to the vendor, the products assist in the creation of localized reports, store data and forward the information to the manufacturing resource planning system.

The Macfactory-ST3 has four ports, one of which is dedicated to the Apple Appletalk network. The other three can run different protocols simultaneously, the vendor said. They can address 32 devices per line.

The Macfactory-ST3 hardware and software cost $1,995.

Synaptic Technologies, Suite C106, 16 Hughes, Irvine, Calif. 92718. 714-859-0570.

Auxiliary equipment

Control Cable, Inc. has added two uninterruptible power supply products to its line of power protection devices for the IBM Personal Computer XT and PC AT.

The **330XT Plus** and the **450AT Plus** are manufactured by American Power Conversion Corp. The 330XT Plus is said to feature a nominal service time of 10 min for an XT. The 450AT Plus provides 20 min for an XT and 10 min for an AT.

The 330XT Plus costs $399. The 450AT Plus costs $499.

Control Cable, 7261 Ambassador Road, Baltimore, Md. 21207. 301-298-4411.

NETWORKING

White papers, red faces

It seems there's been a major run on white paper down on LAN Lane. No, it's not because of a white sale sponsored by the local stationery shops, but rather a version of the axiom, "Those who can't, teach." In this case, it might be better rephrased to read, "Those who haven't delivered generate a lot of hot air."

The mails are being flooded with white papers on OS/2 networking from LAN Manager proponents and co-developers 3Com and Microsoft. Every unbeliever Novell was slated to deliver a white paper outlining its product strategy last Friday. And the last of the triumvirate of dominant local-area network operating system vendors, Banyan Systems, was also readying its own white paper, reportedly addressing IBM's Systems Application Architecture, of which OS/2 is the first piece.

To be fair, white papers — at times a manifestation of all talk and no action — can be beneficial, indeed eagerly received, if used to clear up confusion or provide technical information. On the other hand, if used to market grandiose claims or slyly create confusion beneficial to the author, then writers accomplish little more than muddying their names. And users should let them know about it.

The papers may be white,
Continued on page 59

Loosening SNA technical knots

IBM addresses peer-to-peer LU6.2 complaints, opens SAA umbrella

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — MIS managers who have been stymied by the technical intricacies of peer-to-peer Systems Network Architecture (SNA) can expect to see IBM products that directly address the problem next year, IBM told *Computerworld* recently.

Since 1983, when the IBM LU6.2 protocols shipped, IBM has received feedback indicating users want more portability, particularly in the multiprocessor environments of IBM System/36 and 370 computers. Users also want applications to communicate across different system environments, according to Donald Haile, director of business and systems management for IBM's Communication Products Division.

IBM has been steadily expanding LU6.2 support across its various systems in the past year or two. For example, last June, the vendor announced LU6.2 for VTAM, VM/SP systems and front-end processors.

However, peer-to-peer SNA has two major flaws, according to a recent report by Forrester Research, Inc. in Cambridge, Mass. First, crucial new elements will not ship until late 1988 or 1989. Second, the communications protocols are so complex that many application developers and MIS managers are reluctant to work with them.

Confusing kaleidoscope

"The demands of migration mean that IBM offers a confusing kaleidoscope of variables for networking," the report stated, including operating systems that "all feature different capabilities," in as-yet-unannounced Network Control Program and several varieties of VTAM. "Users must build a strategy from this jumble of options," the report continued. The complexity of new SNA will be particularly daunting for neophyte departmental end users — a primary target for the IBM 9370."

According to IBM spokesmen from the Raleigh research and development facility, IBM will make some major communications announcements next year that will address the problem of LU6.2 complexity.

One key development, which started this fall, is the development of standard programming interfaces that will allow applications to migrate and communicate across different IBM systems within the Systems Application Architecture (SAA) umbrella, Haile indicated.

As part of the SAA direction, IBM introduced the Common Programming Interface (CPD) earlier this year, which is the idea of having a simple, uniform set of commands that each SAA service or system incorporates in its application interface. This
Continued on page 58

Continuous process industries slow LAN

Probable cause: Manufacturers have put off plantwide integration of systems

DOLLARS IN MILLIONS

Percent annual growth: 9.6%

INFORMATION PROVIDED BY
VENTURE DEVELOPMENT
CORP. (VDC)

Yesterday's net mavericks sitting on LAN laurels

BY ELISABETH HORWITT
CW STAFF

Continuous process manufacturers, which led the charge in industrial networking installations in the early 1980s, have held back from the next step of interconnecting different production processes and vendors' equipment, according to a recent report from Venture Development Corp.

Chemical/petrochemical manufacturers, oil refining companies and utilities began installing distributed control networks as far back as 1975, according to Venture. Contrary to vendors' and industry experts' expectations, however, many of these companies have not gone on to link their islands of automation into a single, plantwide network, the Natick, Mass., research firm asserted.

The industrial local-area network market for continuous process industries will grow 9.6% annually for the next five years, the report said (see chart).
Continued on page 58

Early peek at 3+Open on OS/2

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. last week staged the first demonstration of its 3+Open network operating system running over IBM's OS/2 in both a workstation and a server.

However, the software exhibited by 3Com was actually a preliminary 3+Open release that was designed to run on an early version of IBM's OS/2 Standard Edition 1.0, as opposed to the version of OS/2 that was delivered last week to various retail stores.

3+Open, which is based on Microsoft Corp.'s OS/2 LAN Manager, is slated for delivery in June 1988, along with the LAN Manager.

3+ additions

At the 3+Open demonstration, 3Com also announced first-quarter delivery of an enhanced version of 3+, its current Microsoft MS-DOS-based network software.

The enhanced 3+ will provide OS/2 workstation support. Pricing and technical details for this interim product will be provided
Continued on page 59

Inside

- Vendors and user organizations to test latest MAP and TOP versions. Page 57.
- Apollo provides commercial support for MAP for the first time. Page 60.
- Harris offers an IBM-compatible local-control unit. Page 65.

Vendors test TCP/IP-Netbios bridge

Event predicated on a standard interface agreed on at March forum

BY PATRICIA KEEFE
CW STAFF

ARLINGTON, Va. — A successful test of a Transmission Control Protocol/Internet Protocol (TCP/IP)-to-Netbios interface, offset by a failure to agree on a standard for TCP/IP network management, was the main event at the second annual TCP/IP Interoperability Conference here.

The show's sponsor, Advanced Computing Environments, said the technically oriented four-day event, which featured day-long tutorials and breakout sessions, attracted about 900 attendees.

Five vendors participated in a demonstration designed to show off the ability of IBM Netbios-based network operating systems and applications to run across TCP/IP-based local-area networks.

Vendors testing their Netbios implementations included Bridge Communications, Inc.; Excelan, Inc.; Ungermann-Bass, Inc.; and Syntax Systems, Inc. Network General Corp.'s protocol analyzer was used to test the various implementations for interoperability.

Pressure pushed standard

The interoperability test was predicated on a standard for a Netbios interface to TCP/IP that was agreed on at an interoperability forum that was held last March.

Without such a standard, multivendor TCP/IP microcomputer networks would not be possible. And without the pressure that was exerted by large users, the standard would have taken much longer to crystallize, according to Bart Burstein, group product manager for Net/1 TCP at Ungermann-Bass.

"The whole thing was driven by large users. We were bludgeoned into it," Burstein said. "Quite honestly, they told us, 'If you don't fit together with the other guys, we won't buy your product.' The message was heard by vendors everywhere, and now we are all actually working together."

In an example of the cooperative spirit, ambiguities within the specification were worked out collectively by the participating vendors prior to last week's test.

"I was quite frankly flabbergasted [that the test] worked as well as it has," Burstein commented.

Single networks

Despite the reason behind the Netbios interface, most of the conference attendees talked about doing personal computer networking over single TCP/IP

nets, equivalent to a single building, Burstein said. His customers tend to want to install one network across multiple sites, he said.

Ungermann-Bass will address the concern of an enhanced version to allow users to support multiple vendor networks with a first-quarter product release, Burstein said.

The Network Management and Gateway Monitoring Work Groups, which had hoped to settle on preliminary specifications for TCP/IP network management and multivendor routing protocols at the conference, were forced to delay a decision for three months.
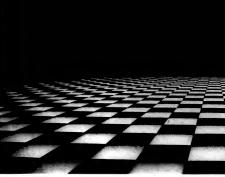
The postponement is said to have resulted from a division among members of the committees.

One group, primarily vendors, rallied behind the International Standards Organization's Open Systems Interconnect (OSI) protocols, while a second group, mostly users, backed another method for managing large networks.

The group plans to choose by February between OSI's CMIS and CMIP protocols and a network management system being developed by BBN Laboratories, Inc.

Giant MAP/TOP demo slated for '88

BALTIMORE — More than 40 vendors and nine user organizations will set up a demonstration network next year to test the latest versions of Manufacturing Automation Protocol (MAP) and Technical and Office Protocol (TOP). The link is scheduled to take place at the Enterprise Networking Event '88 International, which will be held here June 6-9.

The local-area network is being designed to test interoperability among different vendors' devices, using the long-awaited MAP and TOP 3.0 releases, according to the Society of Manufacturing Engineers.

The network will link nine worldwide sites belonging to a variety of industrial organizations, including Deere & Co., Boeing Computer Services, TRW, Inc. and General Motors Corp. Other organizations slated to participate in the event include the British Department of Trade and Industry and European-Wide Computer Networks for Manufacturing Applications, which is managed by British Aerospace PLC. The LAN will also link all the booths on the convention floor.

Among the vendors participating in the demonstration will be AT&T; Bull International; 3Com Corp. subsidiary Bridge Communications, Inc.; Concord Communications, Inc.; Control Data Corp.; Digital Equipment Corp.; Eastman Kodak Co.; Hewlett-Packard Co.; Micom Systems, Inc. subsidiary Interlan; Retix Co.; Touch Communications, Inc.; and Unisys Corp.

The event will be cosponsored by the MAP/TOP Users Group and the Corporation for Open Systems.

Tools to test whether various vendors' equipment conforms to MAP and TOP protocols are being developed by the Communications Network for Manufacturing Applications Esprit project, sponsored by the Commission of the European Communities. Participants in the project will include Nixdorf Computer Corp., Ing. C. Olivetti & Co., BMW AG, Peugeot SA and Bull. After the event, the test tools will be marketed by Standard Promotion and Application Group Services.

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Mavericks

In contrast, revenues from discrete and batch-manufacturing LAN installations should grow at a 20% annual rate, Venture predicted.

Perhaps the biggest reason for the current slowdown in continuous process networking, according to Venture, is the conservative attitude of designers and systems planners.

Network implementers surveyed by Venture said they needed proven and reliable networks to support critical plant processes, particularly real-time control applications.

Tried and true

With reliability as a major concern, continuous process industries have stayed away from unproven and unfamiliar networking technologies, preferring to stick with known products and vendors. This explains in part why continuous process companies have been behind discrete and batch manufacturers in the adoption of the Manufacturing Automation Protocol (MAP) networking standard, the report said.

Many continuous processing firms are waiting for the technology to prove itself, Venture said. One reason they feel that they can afford to do this is that, unlike many discrete and batch manufacturers, which use a wide variety of vendors, continuous process manufacturers tend to rely on one vendor for all process control requirements in a particular plant area.

The success of MAP will depend on its adoption by all manufacturing industries, Venture said. Currently, however, only a few of the largest continuous process firms have committed to implementing the standard.

SNA

allows applications to be written to the same set of verbs, screening the programmer from the intricacies of the underlying system — such as VTAM or LU6.2. Such applications will be portable across all of the systems within SAA without the need to rewrite them for each system, Haile claimed.

In October, IBM introduced a Common Programming Interface for Communications (CPI/C), which provides a uniform set of verbs for applications to call LU6.2 functions.

The initial introduction, designed for Versions 6 and 7 of the VM/SP operating system, is scheduled for shipment in October 1988, along with IBM's implementation of LU6.2 under VTAM in the VM environment.

This should make it a lot more feasible to implement VM applications on "true LU6.2, because we had to concede that VM is not really an SNA environment — although we're working on it," Haile said. IBM plans future introductions of CPI/C for other SAA systems, "so that eventually you won't have to say 'Execute CICS' but just write simple CPI/C verbs" to access LU6.2 peer-to-peer networking functions across different systems, Haile said.

An IBM programming priority is to provide an SAA interface that allows an application to use LU6.2 verbs to obtain direct access to a data base on another system, according to Vijay Ahuja, IBM senior programmer for SAA.

The CPI for communications only links applications. IBM's Distributed Data Manager (DDM) provides the direct link to data bases but is not part of SAA and is not supported by the common programming interface. As a result, "it takes a lot of software work" to port applications written for DDM across different IBM systems, Ahuja said.

IBM is also working on a common directory that will establish routing paths for applications to communicate across a multiprocessor environment, Haile said. "Right now, SNA programmers have a lot of responsibility for defining routes," he said.

Apollo backs MAP standard with interface

BY ELISABETH HORWITT
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. has taken the Manufacturing Automation Protocol (MAP) plunge, entering into an agreement with Concord Communications, Inc. of Marlboro, Mass., to provide interface between Apollo workstations and MAP 2.1 networks.

This is the first time Apollo has provided commercial support for the factory networking standard, according to Robert Chiras, the vendor's group marketing manager for communications and networking. An increasing number of customers have asked Apollo's sales force for ways to link its workstations with devices on the factory floor, such as programmable logic controllers, Chiras said.

Apollo said it feels this is the right time to support MAP, because the technology has matured "beyond the stage where most users are pioneers who catch all the arrows from the Indians." Early users who have stuck with MAP are now demanding that workstation vendors such as Apollo provide MAP compatibility, Chiras added.

"The people I talk to more and more say they want to distribute information" between factory floor devices and other areas of manufacturing, such as design, Concord spokeswoman Suzanne Barclay said.

"MAP is spreading beyond the factory floor to materials planning, CAD and inventory control, and workstations are a big part of that market," Barclay added.

For example, Deere & Co. has linked its computer-aided design (CAD) workstations to computerized numerical controllers, "so that if a part goes wrong, the user can actually pass the corrections back to the CAD station," Barclay explained.

Partners since summer

Apollo and Concord have worked together since this past summer to modify Concord's Mapware Series 1200 Communications Controller and software to work with Apollo workstations, Chiras said.

The two companies performed joint testing to ensure that the controller and the workstation will work together, he added. Under the agreement, Apollo will refer all requests for MAP interfaces to Concord.

The workstation vendor chose Concord because its interfaces feature frequency agility and network management and can support up to eight simultaneous sessions, Chiras said, "and because we think they are in [the MAP arena] for the long haul." The interface will be upgraded to MAP Version 3.0 when the newest MAP release is available, Chiras said. "Until then, we have the basis" for MAP networking, he said.

The Mapware Series 1200 is an IBM Personal Computer AT-compatible device said to support all seven layers of the MAP model. Available immediately, the controller is priced at $2,695.

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For complete information on KMW channel interfaces, protocol converters and graphics processors, call the toll-free number below. Or write KMW Systems, 6034 W. Courtyard Drive, Austin, TX 78730.

Keefe

but in this instance they were triggered by Big Blue's unveiling of its own LAN Server at Comdex/Fall '87 last month.

Adding to the general state of confusion enveloping the PC LAN arena these days, IBM preannounced a product slated for delivery in November 1988 that requires OS/2 Extended Edition (scheduled to ship in July), adding it would use portions of LAN Manager, which is also scheduled to ship in mid-year or thereabouts.

However, IBM said it would not endorse LAN Manager and will not support LAN Manager applications programming interfaces. IBM encouraged software developers to write to the Advanced Program-to-Program Communications (APPC) interface.

Invisible support

3Com was the first to respond with a white paper promising support for APPC and guaranteeing compatibility with LAN Manager, LAN Server and, last but not least, any applications written to OS/2. Pretty interesting, given that with the exception of OS/2 Standard Edition, none of the above mentioned products is supposed to ship for another eight months.

In addition, 3Com has a June delivery date for 3+Open, a new version of its 3+ network operating system. To its credit, 3Com demonstrated support for OS/2 on the workstation and server sides last week for the first time. That's a step in the right direction.

Rumor has it that Microsoft was less than thrilled by the cocky tone of 3Com's paper: So much so that two weeks ago, Microsoft released its own white paper, which essentially echoes technical information in 3Com's dissertation, albeit with a much more low-key approach.

The name game

There are two interesting twists to the Microsoft paper. First of all, Microsoft has renamed two portions of the LAN Manager, now called LAN Server (server software) and requestor (redirector). By coincidence, IBM uses the same names. Deliberately or not, Microsoft appears to be trying to confuse users, who already have enough trouble sorting out the dif-

ferences between the Microsoft and IBM offerings.

And then there's Novell. Ever the busy bee, Novell is bursting at the seams with preannounced — but unshipped — products. Let's see, there's Systems Fault Tolerance Level III (file server mirroring); Netware for Apple's Macintosh, announced more than a year ago; Netware for VMS; and Advanced Netware 2.1.

The latter Novell ware was first unveiled in February, announced again in August, slated to ship in September and, last we heard, scheduled to ship last Friday. Netware 2.1 was delayed in order to add OS/2 support, Btrieve and Novell's Message Handling Service, a spokeswoman said.

Meanwhile, Novell, too, has been making promises, namely that it will support OS/2 at the server without licensing LAN Manager. (3Com vehemently insists Novell can't pull this off.) Again, it's hard to cut through the gale force here without even knowing how Novell plans to accomplish this, never mind without experiencing the look and feel of a real product.

In the dark

Banyan also has yet to detail its position on OS/2 networking beyond supporting OS/2 at the workstation. Banyan tends to wait for other players to go public with their plans before commenting themselves, a spokeswoman said. "The problem is that no one really knows what

IBM is doing," she added. Nor does anyone know what Banyan is doing, at least as far as OS/2 is concerned.

The point here is that although the vendors may see white papers as a valid form of air freshener, all users end up with is yet another layer of obfuscation. Without actual products to compare all these explainers, claims and guarantees with, it's debatable how much comfort white papers really offer corporate planners and strategists.

So, passing on a tip from Col. North, let's shred those papers, zip those lips and start shipping some iron, or I should say in this case, software.

Keefe is a Computerworld senior editor, networking.

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3+Open

vided within 60 days, 3Com said.

Customers who purchase this version or an upgrade package for their current 3+ will receive full credit when they migrate to 3+Open, the company said.

3Com said the product was designed to give users assurance that their investment in 3+ guarantees OS/2 server and workstation compatibility in the future.

The demonstration featured 3Com's Etherlink Plus adapter and an Intel Corp. 80386-based workstation adapted for use as a 3+Open OS/2 server.

The configuration also supports 3Com's Tokenlink Plus adapter. Features include windowing, pull-down menus, remote server access via interprocess communications, a concurrent-mode server operation, session management features and audit trail capabilities.

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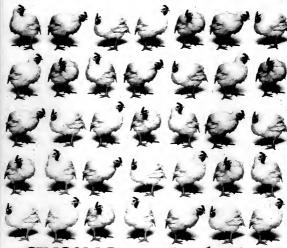
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CINCOM Boosts Production At Holly Farms.

NEW PRODUCTS

Local-area network hardware

An IBM 3174-1L-compatible local-control unit has been introduced by Harris Corp.'s Data Communications Division.

The controller, called the H174-32L local-control unit, features token-ring network support and a distributed multi-microprocessor design for support of up to 56 devices. Support for up to 2.5M bytes of memory and a second diskette drive are also included.

Other features include support for multiple concurrent sessions, network management facilities and an integrated English-language user interface.

The H174-32L local-control unit is priced from $12,500.

Harris, 16001 Dallas Pkwy., Dallas, Texas 75248. 214-386-2000.

Local-area network software

Version 2 of Lanbatch, a batch processor system for Novell, Inc. Advanced Netware, has been announced by Keylogic, Inc.

Lanbatch allows network users to submit batch jobs to a separate workstation, freeing their terminals for other work. The batch transmitter provides control over such features as queue priority, path control and job scheduling.

Version 2 includes daily repeat jobs, additional queue control functions and job-log files. Multiple batch servers working from a common queue are offered as an option. A utility that allows execution of a job to be executed on different batch processor workstations is also included.

The software costs $125 for a single batch server and $325 for multiple batch servers.

Keylogic, P.O. Box 13063, Research Triangle Park, N.C. 27709. 919-544-6071.

Customer-premise equipment

Racal-Milgo has added Switchlink-56 to its digital access product line.

Switchlink-56 is said to provide dial-up 56K bit/sec. digital transmission using AT&T's Accunet switched 56K bit/sec. service. It operates as a dial-up data and customer service unit for synchronous, full-duplex data communications over four wires.

The device can be used to back up a critical point-to-point data phone digital-service circuit until that circuit is restored or to transmit overload during peak traffic hours. Other applications include back-to-host file transfers and personal computer-to-PC communications.

Switchlink-56 costs $3,200.

Racal-Milgo, 1601 N. Harrison Pkwy., Sunrise, Fla. 33323. 305-475-1601.

Gulfstream Microsystems, Inc., a division of DEST, has announced a single-slot personal computer-to-facsimile add-in card that reportedly allows applications to print output to a distant facsimile machine by emulating a printer.

EZ-Fax is said to support multitasking. According to the vendor, it automatically manages conversion of data for transmission or printing, sending and re-

ceiving messages, spooling foreground and background tasks and scanning. It routes each incoming message both to the printer and to a holding file and performs unattended dialing and redialing.

The card supports such popular printers as Epson America, Inc.'s FX series; IBM's Graphic Printer; and the Hewlett-Packard Co. Laserjet series.

The EZ-Fax card works in IBM Personal Computers and compatibles. It costs $1,495.

Gulfstream, 1065 S. Rogers Circle, Boca Raton, Fla. 33487. 305-994-6500.

Links

S&H Computer Systems, Inc. has introduced software for micro-to-minicomputer communications.

The software, called Messagenet PC and Messagenet VAX, is said to allow personal computer users to transfer messages and files to Digital Equipment Corp. VAX minicomputers and other PCs running Messagenet. It also automates the use of Western Union Telegraph Co.'s Easylink Instant Mail Manager and MCI Communications Corp.'s MCI Mail electronic mail services, the vendor said.

Capabilities include editing, transmission scheduling, mailing lists, archiving and system use monitoring. Other features include a word processor, acceptance notification, a file folder storing system, an address book and a calendar function.

Messagenet PC costs $185. Messagenet VAX costs from $1,125 to $3,000.

S&H Computer Systems, 1027 17th Ave. S., Nashville, Tenn. 37212. 615-327-3670.

SimPC Master, a communications and file transfer package said to support application integration over coaxial, local-area network, IBM Systems Network Architecture, asynchronous and CCITT X.25 connections, has been announced by Simware, Inc.

The product includes IBM host and Personal Computer components that provide MVS/VTAM, GCS/VTAM and VM sites with the ability to link PC users with corporate data communications networks and departmental processors. Support is provided for full-screen file transfer of IBM's CICS, TSO and CMS application data. Users can also upload and download most IBM PC-DOS files.

Also featured are background file transfer, customizable functions and support for Xmodem and Kermit.

SimPC Master costs $325.

Simware, 20 Colonnade Road, Ottawa, Ontario, Canada K2E 7M6. 613-727-1779.

Modems/Multiplexers

A full-duplex 9.6K bit/sec. CCITT V.32 modem has been introduced by Anderson Jacobson, Inc.

The AJ 9631-SA operates synchronously or asynchronously on dial-up networks. It features trellis-coded modulation, local and remote echo cancellation and satellite transmission capabilities. In leased-line operation, the AJ 9631-SA features unattended automatic dial backup on the switched network.

Other features include autodialing, front panel controls and such diagnostics

The AJ 9631-SA modem

as standard loop-back tests and an end-to-end test.

The AJ 9631-SA costs $3,095.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131. 408-435-8520.

A modem that includes a CCITT X.25 packet assembler/disassembler (PAD) has been announced by Telenetics Corp.

The Model 24S-MP is a 2,400 bit/sec. half- or full-duplex, synchronous or asynchronous modem with an X.25 PAD option. The option allows the modem to communicate directly with X.25 packet-switch networks.

The modem meets CCITT V.22 and Bell 212 and 103 standards. It uses the standard Hayes Microcomputer Products, Inc. AT command set and offers autodial and autoanswer. The PAD option provides a six-digit stored ID. Statistics include time and date of call, call and telephone connection duration, packets and segments.

The Model 24S-MP costs $595. The X.25 PAD option costs $150.

Telenetics, 895 E. Yorba Linda Blvd., Placentia, Calif. 92670. 714-524-5770.

Concord Data Systems, Inc. has added the 296 Trellis modem to its line of 9.6K bit/sec. CCITT V.32-compatible modems.

The 296 Trellis is a full-duplex asynchronous and synchronous modem built to the V.32 standard. Its features include

full-duplex two-wire dial-up and leased-line communications, Microcom Networking Protocol Class 4 error correction and remote modem configuration capabilities. The product also provides automatic dialing and answering capabilities.

The 296 Trellis costs $1,795.

Concord Data Systems, 397 Williams St., Marlboro, Mass. 01752. 617-460-0808.

Astrocom Corp. has announced that its Series 8000 service digital multiplexer meets compatibility standards for use with AT&T's Subrate Digital Multiplexing Service.

According to the vendor, the test for compatibility was conducted at an AT&T test facility in Holmdel, N.J.

The product is available in configurations supporting five, 10, 15 and 20 ports. Pricing starts at $3,350.

Astrocom, 120 West Plato Blvd., St. Paul, Minn. 55107. 612-227-8651.

A T1 multiplexer for data communications has been announced by Coastcom.

The multiplexer, called T1 M, is said to take synchronous and asynchronous data from local-area networks, computer-aided design and manufacturing, facsimile, personal computers or host computers and convert it into a T1 signal to be used for connection to a public or private T1 network.

According to the vendor, synchronous data is protocol-transparent and is compatible with Digital Equipment Corp.'s DMR11 synchronous interface.

Four independent data ports and an optional voice-maintenance port are provided; in addition, any data rate up to 1.54M bit/sec. can be selected for each data port, the vendor said.

T1 M is priced from $3,895.

Coastcom, P.O. Box 27066, 2312 Stanwell Drive, Concord, Calif. 94527. 415-825-7500.

HARD TALK
James Connolly

Get the max from a mini

Amid all the talk about downsizing and how personal computers today pack the raw CPU punch of yesteryear's mainframes, it may be easy to forget an entire class of systems that benefit from the same circuit integration in PCs.

The first Motorola 68030-based minicomputers have been scheduled for delivery by companies including Motorola, General Automation, Alpha Microsystems and Harris. Built around a chip that went into production three months ago, the systems are making their debuts about a year after PCs and minicomputers based on the 80386 chip made its Motorola's rival, Intel. A string of 68030-based systems are likely to be announced during 1988 as workstation and minicomputer vendors upgrade their Motorola 68020-based products.

A pattern has set in, with vendors leapfrogging their own products as denser, faster chips are announced and chip makers leapfrog each other. Intel, Motorola and National Semiconductor have each staked claims to the fastest chips at various times, and those players have

CDC plots to lure fresh users

BY JEAN S. BOZMAN
CW STAFF

MINNEAPOLIS — Control Data Corp. is looking for a new type of customer — one who does not already own a CDC mainframe or Cyber 205 computer.

To branch out, CDC is trying to improve the way its sales force learns about new products — and to portray its product line as a continuum series running under the company's NOS/VE operating system.

Gil Williams, vice-president of CDC's Computer Systems group and one of the executives charged with the job of restoring order after several years of fi-

nancial difficulties at CDC, recognizes that not everyone is ready for CDC's 64-bit architecture, particularly not those in IBM mainframe shops.

Industry analysts say that CDC's base is stable but susceptible to erosion from Digital Equipment Corp. and IBM.

Williams said he believes that even in mixed accounts, inroads can be made through the reintroduction of engineering workstations and mid-range Cyber 930 departmental processors. One added attraction is the availability, through the CDC sales force, of high-end supercomputers from ETA Systems, Inc., a CDC subsidiary.

According to Williams, new

Gil Williams

business comes both from the U.S. and abroad. Much of it stems from the purchase of the Cyber 930, introduced earlier this year, Williams said. "Fifty

Data View

MIPS explosion
U.S. installed base of IBM 3090s overpowers that of IBM 3033 at comparable points in product cycle

Processors shipped	MIPS*
	$3,000
4,000	
	1,800
800	

*Million instructions per second

INFORMATION PROVIDED BY
ANNEX RESEARCH AND COMPUTER
INTELLIGENCE

Harris's Night Hawk system expands real-time offerings

Introduction includes Ada engineering tool set

BY JAMES CONNOLLY
CW STAFF

FORT LAUDERDALE, Fla. — Harris Corp.'s Computer Systems Division made its first commitment to the Motorola, Inc. 68030 microprocessor with the recent introduction of an Ada-oriented family of multiprocessor real-time supermicrocomputers.

In addition to announcing the Night Hawk family, Harris added software engineering tools to its 68030 development environment and expanded the real-

time capabilities of its MCX family of Unix-based supermicrocomputers and H series supermicomputers.

Harris officials claimed Night Hawk, which was designed to support trainers and simulators and overlaps the lower end of the H series, features up to eight tightly coupled CPUs, each including a 68030 chip and a floating-point accelerator, in a single cabinet.

The company said the memory hierarchy includes on-chip cache, on-board global memory

Alpha pulls a fast one with 68030

BY JAMES CONNOLLY
CW STAFF

SANTA ANA, Calif. — The first computer systems based on the Motorola, Inc. 68030 microprocessor will be shipped by the end of this month, according to Alpha Microsystems, which plans a 68030 product introduction today.

While other vendors, including Motorola, have already scheduled 68030-based systems for deliveries for next year, Alpha Microsystems officials claimed that their firm's AM-3000 series will be the first generally available 68030-based systems.

Gary L. Nelson, Alpha Microsystems director of marketing, said the AM-3000 is currently being used at a beta-test site and is available immediately. Nelson said the AM-3000 extends the company's product line by more than doubling the number of users supported on the Motorola 68020-based AM-2000 family.

Nelson said the AM-3000

Connolly

been challenged by makers of special-purpose chips, such as those based on reduced instruction set computing architectures.

Intel claimed to better the 68020 with the 80386, which has been rated at about 4 mil-

lion instructions per second (MIPS), and Motorola came back with the 68030, which has been rated at up to 8 MIPS. National Semiconductor, meanwhile, says its NS32532 will run at 15 MIPS.

While the chip makers and their customers in the computer manufacturing community have elbowed past each other for prominence, it may be easy to

lose perspective on what kind of punch these chips pack.

If the 80386 does even half of what some people claim it can and performs 2 MIPS, that is roughly twice the CPU power of the IBM 370/158 that was a standard for mainframes almost 15 years ago.

If the 68030 reaches half of its potential and performs 4 MIPS, that would place it in the

heart of the IBM 3083 family, which was a standard for mainframes just five years ago.

PC on a mainframe

All of this does not mean that a desktop PC or workstation can do what a mainframe could do a few years ago, if only because wiring 500 terminals and printers to an IBM Personal System/2 would be the headache of

the century.

But putting 80386 or 68030 power into a minicomputer, whether the CPU is a commodity chip or a proprietary design, means that departments or machine-room businesses can put the quick response times that were missing a decade ago.

It also means those users can think about using complex software packages — such as relational data base management systems — while having enough horsepower to hide the complexity behind the excess MIPS and perhaps making computers easy for the end user to use.

Connolly is Computerworld's *senior editor, systems & peripherals.*

Harris

cache and local and global memory. The primary I/O architecture is the 40M byte/sec. Harris VMEbus.

Runs Unix versions

Night Hawk runs Harris's CX/RT real-time production operating system as well as the company's CX/UX dual-universe implementation of AT&T's Unix System V and the University of California at Berkeley's Unix 4.2.

A basic system with 2M bytes of memory, one CPU and minimal I/O and software costs about $55,000. It will be available during the fourth quarter of 1988, Harris said.

The Ada tool set, which will be known as the Harris Ada Programming Support Environment for Software Engineering, was designed for all Harris CPU platforms.

It includes 26 tools intended to help an Ada designer create, review, manage, document and test software designs. The tool kit is based on an Ada program design language that meets the requirements of the U.S. Department of Defense, according to Harris.

RT-VOS enhancements

The improved capabilities announced for the H series' RT-VOS operating system include increased flexibility for the frequency-based scheduler, enhanced performance monitoring and interactive display and modification of variables from any processor in a multiple-processor complex.

The additions to the MCX machines include a real-time operating system and a 68030 upgrade board that can replace the machine's existing Motorola 68020 CPU.

The upgrade costs $20,000, although discounts will be available on orders placed before the end of February, according to Harris.

CDC

percent of our business in CDC 930s comes from customers who never before have owned a Cyber machine," he said.

"There are three tiers to our strategy," Williams said. "We like to talk about providing a transparent link between an end user's workstation, the company's general-purpose computer and the supercomputer." That link, of course, is NOS/VE, which will support Unix throughout the CDC line, as well as CDC-specific applications. (Unix support on the ETA-10 is not yet available.) Multiple networking architectures are also supported, including links to Transmission Control Protocol/Internet Protocol, IBM's Systems Network Architecture and CDC's Loosely Coupled Network.

Williams envisions a day when executives, engineers and office managers can link to a variety of mainframe hosts through their PCs. The ability to query IBM's DB2 via SQL is already available, as is the ability to query Oracle Corp.'s relational data base management system. CDC's Engineering Data Library, now called an Environment Management System (EMS), acts as a repository for computer-integrated manufacturing (CIM) drawings and vectorized data.

Technology alienates sales force

That environment may be attractive, Williams said, but it will not be marketable unless the CDC sales force understands it. "CDC has had the ability to produce fast computers, but there really wasn't a marketing function here that spent a great deal of time translating the technology to

the sales force. We had good products, but we didn't know how to talk about them." Monthly newsletters and frequent seminars have been instituted to counter the communications problem.

CDC has no illusions about being the only vendor at a user's site. "I don't think we are arrogant enough to say to a customer that we are your entire environment," Williams said. He sees CDC's opportunities in the areas of scientific computing, engineering, CIM and DBMSs. Today, two-thirds of CDC's customers are described as "technical" rather than "commercial" accounts.

Aware that it cannot take its installed base for granted, CDC recently undertook a study of its user sites, identifying product requirements and weak areas.

Don Young, a securities analyst with Sanford C. Bernstein & Co., said he believes CDC's mainframe base of some 1,300 is susceptible to erosion and that CDC management is aware of it. "Over the next two to three years, about 20% of these machines are at risk, and about 10% will probably be lost," Young said.

But Williams' strategy of gaining new accounts with scientifically oriented Unix machines and small Cyber 930 processors should rebuild the base, Young said, and the situation should stabilize by 1990. "It should come together for CDC in 1991, when they could be the single largest provider of technical computing systems."

Vertical solutions will, in general, be deemphasized — a turnabout from the company's position several years ago.

The only exception will come in the area of energy management applications, or software specific to running a nuclear power plant or other electric utility. CDC already has a significant share of the utilities management market and does not intend to give it up, Williams said.

Finally, customers can expect to see familiar hardware and software packaged with CDC offerings, Williams said.

"We intend to keep on top of the programs offered by independent software vendors, because the expertise in any given vertical application does not have to reside here at Control Data," Williams said. "Our fundamental task is to provide the hardware platform and the environment, not to know the customer's business better than he does."

Alpha

supports a maximum of 360 users and that the system could support that many active, concurrent users in applications such as data entry with 3- to 4-sec. response times. He said the AM-3000 is intended to support more than 150 users in general-purpose computing environments.

The AM-2000 series remains available and can be upgraded to the AM-3000 through a 10-minute CPU board swap, according to the vendor.

Like the AM-2000, the new systems are based on Alpha Microsystems' AMOS operating system. The company, which claims an installed base of more than 30,000 systems, abandoned a Unix offering last year.

The AM-3000 uses a 20-MHz 68030 CPU and 32K bytes of on-board cache memory. It is available in three configurations and supports up to 120M bytes of memory and 3.4G bytes of on-line storage. The three configurations include a tower version with six Motorola VMEbus slots and two rack-mount versions with 10 or 21 VMEbus slots.

The systems use a multiprocessor design in which microprocessor-based controllers can be added for tasks such as terminal I/O, disk management and tape management.

A basic tower configuration costs $40,000 with the CPU, six slots, 8M bytes of memory, 150M bytes of disk storage, 30 serial ports and an operating system license.

NEW PRODUCTS

Turnkey systems

An entry-level publishing system based on a Sun Microsystems, Inc. workstation has been announced by Tenet Corp.

The system, called the Live Page 300, includes the ven-dor's Live Image Electronic Publishing Software, featuring such document-management capabilities as revision control, point pages and an intelligent table of contents. The software also has an object-oriented, hierarchical data base. The system interfaces to Adobe Systems, Inc.'s Post-script-compatible output devices.

The LP 300 is priced at $29,995.

Tenet, Box 126, 37 Broad-way, Arlington, Mass. 02174. 617-641-2900.

Processors

Motorola Computer Systems, a subsidiary of Motorola, Inc., has added the Model 150 super microcomputer to its System 800 family of platform products.

Based on the Motorola 68020 operating at 16.67 MHz, the Model 150 features 4M bytes of on-board memory and the AT&T Unix System V, Release 3 operating system.

It has a six-slot VMEbus and supports one fixed disk drive, one floppy and one streaming tape drive.

Pricing ranges from $10,000 to $25,000.

Motorola Computer Systems, 10700 N. De Anna Blvd., Cuper-tino, Calif. 95014. 408-255-0900.

Data storage

Half-sized Winchester disk controllers featuring autoconfigurable BIOS, power capabilities for hard-card applications and surface-mount technology have been introduced by Data Technology Corp.

The 5150CR supports up to two 5¼- or 3½-in. Winchester drives in any combination of fixed or removable drives. The 5090CR is a run-length-limited controller that supports up to two additional 5¼- or 3½-in. Winchesters in any combination of fixed or removable drives.

In volume OEM quantities, the 5150CR costs $50 and the 5160CR costs $60.

Data Technology, 2551 Walsh Ave., Santa Clara, Calif. 95051. 408-727-8899.

Terminals

A business presentation product called the Videoshow Professional System has been announced by General Parametrics Corp.

The system is said to allow a presenter to integrate photographic images and computer-generated images in the same picture. It can produce presentations in video, slides and overheads. Other features include the abilities to synchronize with multiple video sources and to capture, edit, combine, compress and display images.

The Videoshow Professional System is priced to $20,000.

General Parametrics, 1250 Ninth St., Berkeley, Calif. 94710. 415-524-3950.

Printers/Plotters

Eastman Kodak Co. has enhanced its Kodak Ektaprint 1392 printer, allowing it to merge data from mainframes with files created using the Kodak Ektaprint electronic publishing system.

The Ektaprint 1392 Model 14 printer can be configured with the Ektaprint 1700 magnetic tape drive operating at 1,600 or 6,250 bit/in. or a high-speed 56K bit/sec. IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) data link.

The data can be transported from the mainframe directly over an SNA/SDLC data link, priced at $10,500, or indirectly using the Ektaprint 1700 tape drive, priced at $24,000. The printer costs $200,000.

Kodak, 343 State St., Rochester, N.Y. 14650. 716-724-1336.

To catch a thief:
Lessons in systems security

BY MICHAEL BALL

LARRY ASHTON

T he Puzzle of the Profane Prankster. Fear and helplessness are not feelings typically attributed to systems managers, but those emotions are apparently what a malicious employee wanted to produce — and did — at the *Calgary Herald* in Calgary, Alberta.

Reporters, editors and MIS staffers alike chuckled the first time obscenities filled their screens, but in a shop totally computerized, from writing through production, with a System Development Corp. turnkey newspaper publishing system, the joke quickly lost its edge.

For six months in 1980, the *Herald's* network was subject to a profane prankster's whims. Obscene messages were embedded in files and in some cases seemed to appear randomly. Editors and managers were powerless, says then-managing editor, Kevin Peterson.

Eventually, the ills of the scalawag and the medium in which he worked were his undoing. Peterson notes. Eliminating network users without the skills for advanced programming quickly reduced the suspect list. Computerized auditing further winnowed down those who entered specific files.

The left a single systems programmer. The motivation appeared to be retribution for a wronged spouse, a former *Herald* reporter who had run afoul with the city editor. The systems programmer was fired.

The *Calgary Herald's* run-in with computer crime is not as dramatic as recent multimillion-dollar insider data diddling or hackers' planting of killer computer viruses, some of which are discussed below. But there are lessons to be learned from the

Bull is a free-lance writer based in Boston.

Herald's experience — and the experiences of other firms described here.

One lesson the *Herald* learned was the importance of good management. While many companies might have looked to computer-based preventions, the *Herald* faced a harder reali-

ty, according to Peterson. "I must admit, it was primarily a management problem," he says. "We should have been able to identify this before it affected our computer operations."

The *Herald* didn't ignore the need for additional security requirements, however. "We add-

ed new levels of security, such as passwords and restrictions on functions various users can perform," Peterson says.

But, as with most computer-dependent shops, burdening a publishing system with security measures would have meant destroying the advantages a computer has over pens and glue pots.

"We had to balance security and access," Peterson explains. "If we restricted our people too much, we'd slow down the writing, editing and production. We'd hamstring our operations."

The *Herald* put the onus of system integrity squarely on management. "You have to hire good systems people and keep them happy," Peterson says. "If you then think you have to put in a whole bunch of safeguards, it's time to step back and say, 'What's wrong with our managers?'" Among the *Herald's* managers, the key now is keeping an eye on morale. "We actively look for bad apples and figure out the problem," Peterson concludes.

The Ruse of the Rotten Refunds. An imperfectly planned system was too much to resist for the supervisor of the Detroit income tax refund section. For nine months, Ronald Cojoe pied his high-level system access and his knowledge of the refund information system's shortcomings to fill his pockets to the tune of at least $123,000.

The system shortcoming that Cojoe, operational officer in the city's refund department, exploited from Nov. 21, 1984, through Aug. 7, 1985, stemmed from the way computerized files were handled on the department's Unisys Corp. mainframes and the way checks were issued, says Lt. Fred Campbell of the Detroit Police Department.

Refunds were assigned a number by case, not by person or business. Cojoe randomly selected a number, increased the

Thief

FROM PREVIOUS PAGE

amount and changed the name and address to those of one of his three cohorts. Once the check was issued, he changed the data back.

Because his department — in effect Cojoe himself — authorized payments and the treasurer's office paid them, "the books always balanced," Campbell says. If a taxpayer inquired about a refund, the computer would show the check issued and cashed. In addition, because the checks were printed with the case number, a bank calling to verify a large check would be told the check was authorized.

Ironically, according to Campbell, when the crimes were first discovered, Cojoe was placed in charge of the investigation from the tax refund side. "He was still issuing checks during that part of the investigation," Campbell said.

Once Cojoe was removed from the investigation, Campbell, Sgt. Charles McEwen and the tax office uncovered a pattern of payments to a dummy construction company and the three accomplices. They checked identification numbers and found businesses that did not exist and taxpayers who said they never received checks.

"He was caught by a fluke and might not have been except for stupidity and greed," says Nancy Alberts, Wayne County assistant prosecuting attorney.

What happened? Cojoe showed up with one of the friends to cash a reissued, manually typed check. The teller called and received an OK, but the income tax division was

alerted to what seemed to be a very large refund for an individual. It was about $4,000, according to Campbell, while the average refund was about $100.

Alberts prosecuted the four under racketeering statutes, as Michigan's computer crime laws are so new. The check cashers received probation; Cojoe was given one to 10 years in state prison and ordered to pay restitution of $123,000. The city also attached his pension.

In retrospect, Alberts adds that she has her own fears of this type of crime. "We catch the stupid ones," she says. "We don't

know how many go undetected."

"It's like the system had neon lights flashing, 'Steal from me,'" says Sanford Sherizen, a Natick, Mass.-based independent computer security consultant, referring to Detroit's income tax refund setup. "The city obviously wanted to make it easy to issue checks — and it certainly did."

The city of Detroit acted quickly to fix the bugs and tighten controls of the system described above. While Ralph Harte, director of the city's income tax section and Cojoe's

boss, understandably will not detail the fixes, he does say that there are now embedded subsystems that automatically produce reports on use, data changes and operators.

"It's a combination of controls, which are mechanical in nature," Harte says. "There are also administrative steps concerning who authorizes and who has access."

This type of crime is not at all surprising, and it will get worse, Sherizen says. "A lot of companies will be in trouble when more sophisticated criminals get started."

W E HAD to balance security and access. If we restricted our people too much, we'd slow down production. We'd hamstring our operations."

KEVIN PETERSON
CALGARY HERALD

The Dastardly Diversion Dilemma. In January 1986, Control Data Corp. spokesman Richard C. Reid announced that employees from its Bloomington, Minn., and Oklahoma City magnetic peripherals arm had been arrested for diverting CDC goods and cash. The crimes were planned around and facilitated by the computerized purchasing and inventory records, which were maintained on CDC Cyber 180 machines.

As much as $20 million in company and outside vendor equipment had been diverted to dummy companies and sold for profit. In some cases, perfectly good parts and submarine parts and submarines were classified as scrap. Employees simply removed the "junk" and resold it, Reid says.

This type of fraud may be a common occurrence today. It is merely a cybernetic version of an old insider scam.

The basics are that a computer operator with access to purchasing or scrap disposal or other resource records fools around with the data. For example, the first step would be to rent a post office box and print bills in the name of a fake company. Next, the victim company is billed for undelivered goods or unperformed services. The operator approves the purchase order and pockets the proceeds.

As with many kinds of systematic thefts, detection most commonly occurs through the computer system. Some purchasing software programs queer buys. A final check, although it occurs at an expensive time to catch the problem, is the accounting auditing cycle.

CDC is more concerned with the stickier problem of prevention, Reid says. The company is looking to technology but will place more emphasis on education and management, he adds.

"An obvious thing we did was use bar coding throughout manufacturing," he notes. Previously, many small, valuable parts did not have their own identification numbers and could have easily disappeared without leaving an audit trail. Now, if parts become missing between storage or production stages, an exception report is printed.

The company also revised its system on scrap and reclamation of parts and materials. This system, too, relies on unique numbers. "Even individual thin-film heads from each wafer are numbered," Reid says.

Yet, CDC does not look to technology to cover the exposure any more than it blames the computers for the thefts. "It was definitely the human factor, both the workers and managers," Reid admits. Of course, managers up and down the chain of command have been made aware of the thefts and related security problems. They have been taking security courses, and the entire company has undergone a security awareness communications campaign.

While that may help, according to security consultant Jack Bologna of Computer Protection Systems, Inc. in Plymouth, Mich., "there are errors and omissions in almost any system that allow security breaches." In this particular type of case, he said it is plain that "the receivables clerk should never be able to access payable files."

Like other victims of computer crime, CDC is not proud of what happened. Putting the best face on it, Reid says, "If you can say anything positive comes out of an experience like this, [it's] that [you] end up with improvements in security procedures and a heightened awareness of losses."

The Hackers Whodunit. In some circles, computer hackers still enjoy the reputation of folk heroes. But the U.S. government and its prime contractors think less highly of those who tinkle with their files, bulletin boards and networks.

Indeed, when young members of the Hamburg Chaos Computer Club (CCC) hacked their way into a variety of European and U.S. corporate and government DEC VAX computers in September, no victim seemed amused. The researcher who lost four months of work when numerical values were changed in his files certainly was not, notes Donn Parker, computer security consultant at SRI International in Menlo Park, Calif.

Why did they do it? The pranksters claimed to be doing everyone a favor by pointing out

the inadequate security of the systems and their software — particularly Unix and the VMS operating systems.

One of the club's targets was the U.S. National Aeronautics and Space Administration, through its Space Physics Analysis Network. The semipublic bulletin board offers postflight data analysis for business and school use, and signing up is an easy trick. What the hackers did was bypass the operating system security, read out the password list and plant one or more viruses in the system, says NASA's Douglas Hunt, manager of the automated information security program.

Even though Europeans are terrorism-conscious and have laws and organizations to deal

Mainframe vice

For the fledgling security-conscious MIS director, here are a few lessons in fighting computer crime:

****

The more DP-dependent your shop, the more vulnerable it is to even a single criminal.

The person most likely to cripple your computer operations is a systems programmer or analyst. Because of his position, this person may be hard or impossible to catch, and the crime may go undetected for months. Systems security measures are all within the criminal's understanding.

Not having any security defense is asking for trouble. However, a pleasant working environment and good management may be better safeguards than any hardware or software precaution.

Getting the security of "religion" after the first recognized computer crime is too late.

MICHAEL BALL

Security systems: Getting management to shell out

BY LARRY STEVENS

Convincing senior management to shell out the money for a security system can be difficult for MIS. The trouble stems from the fact that although computer crime is a serious problem, it has, by and large, been swept under the carpet.

According to Richard Cashton, assistant director of the D. W. Mattson Computer Center at Tennessee Technological University in Coolville, Tenn., where the security system includes a sophisticated, universitywide password setup, "A lot of upper managers want to try to ignore the problem into nonexistence. They want to keep the illusion that only highly trained technicians are sophisticated enough to do computer crime." He adds that "they also don't want to admit they have a bad system, lest as they don't want to admit they have bad management at any level."

Indeed, when a breach of security does occur, it is often considered a reflection on the organization, says Belden Menkus, a Middleville, N.J. based management security consultant. As a result, many companies do not press charges, preferring instead to allow the suspected individuals to quietly resign.

Shhh . . .

"Most MIS managers try to keep it hidden from upper management, most upper managers try to keep it from the board, and most boards try to keep it from stockholders," Menkus says.

William Burgess, vice-president of information systems at The Prudential Insurance Co. of America in Newark, N.J., agrees. "The fact that many companies tend not to widely discuss the incidence of computer crime is a factor making it difficult to get management to buy a system," he says. "Many managers simply do not fully appreciate the dangers involved." Prudential has password systems, which control general access to files as well as usability of functions, installed on its IBM 3090 and 3080 series computers.

In addition, MIS will often find top management turning a deaf ear to proposals for funding of a security system. Thus, Menkus says, occurs because managers are used to spending money on hardware and software to increase capacity and speed. A security system, however, does neither; in fact, it will likely degrade a system slightly.

"Any security system will cause some delay and some growth of files," Menkus maintains. "It's tough to get someone to spend money for something that does not increase output, that seems to be of little use and that degrades the system."

Yet securing data may be vital not only to the corporation but also to the individual responsible for maintaining the sys-

Stevens is a free-lance computer industry writer based in Springfield, Mass.

tem, Menkus points out. "In too many organizations, the first thing that top management does when confronted by a security problem is to look for someone to blame. Often, that person is the guy who discovered it."

According to Sanford Sherizen, a Natick, Mass.-based computer crime prevention expert, one way to sell a security system to senior management is to point out that they "own the problem." He explains, "If a breach of security occurs, it's senior management, not MIS, who will be held up for criticism."

Sherizen points out that when the Bank of Boston was implicated in money laundering because it accepted large deposits in small bills, "it wasn't the auditor who had to answer to congressional committees, to the press and to angry stockholders, it was the CEO."

Buck BloomBecker, director of the National Center for Computer Crime Data in Los Angeles, a nonprofit research institute, goes further in attributing computer crime responsibility. He says the day is approaching when corporations and may be even CEOs will be held liable for financial loss or loss of privacy that results from computer crime.

"It's something that is now being argued philosophically in law journals," Bloom-Becker explains. "But today's philosophy is tomorrow's practice. It may not be long now before [bank] CEOs are sued because someone has had his private account illegally accessed. And the defense against such a suit is to be able to prove that adequate security equipment and measures

Richard Cashton

were in place."

Sherizen adds that unless security is adequate, it might even be hard to take action against guilty parties. "When someone in the organization is found to have been using the computer for crime, the first impulse is to fire him. But if a data base is not fairly protected, the individual can contend he didn't know he was not allowed to access it. Or if audit trails are not complete enough to lead directly to only one person, the individual can later deny committing the crime. He can then sue the company for back wages as well as defamation of character."

Legal problems notwithstanding, in some organizations the only way to sell top managers on a security system is to feed them figures on how much money is likely to be lost in a security breach.

Theoretically, the most scientific way to do this is through risk-analysis software, which uses complicated heuristics to determine the vulnerability of a computer. Examples of this product type include Riskcalc from Pacemart-Spence, Inc. in Washington, D.C.; Risks from Danville, Calif.-based Chesapeake Computer Group; and, from Profile Analysis Corp. in Ridgefield, Conn., Riskpac.

Although these types of programs

come close to scientifically analyzing risk, there is some controversy as to how accurate they are. The problem, Menkus says, is that there is not a large enough statistical base from which to work.

"These programs often start playing around with weighted averages and probability," he explains. "But unfortunately, because there are so few statistics on computer crime, there is little basis for making these estimates."

Because of this deficiency, management may not accept the results of a risk analysis and may instead insist on more down-to-earth numbers — numbers that are not available.

The solution, Sherizen says, might be to use figures for general white-collar crime as a guide to the extent and potential danger of computer crime. "A company normally has strong procedures for protecting against embezzlement and other white-collar crimes. Computer crime is nothing more than white-collar crime with a new medium. Every time you train an employee on the computer, you're also training him to use that computer to rob the company. There is little sense in protecting yourself against white-collar crime without protecting yourself against computer crime."

Perhaps one of the reasons MIS has had a tough time convincing senior managers to take computer crime seriously is that the most publicized examples of security breaches are of young hackers or petty criminals. It's hard to justify spending tens of thousands of dollars to protect yourself against teenagers. But management has to be made aware of the fact that computer crime is much more serious than first assumed.

Tennessee Tech's Cashion declares, "Hackers have gotten the headlines, and that has been a double-edged sword for us. On one hand, it has made management aware of the need for security. But on the other hand, it has caused them to underestimate the magnitude of the problem."

According to BloomBecker, hackers are the least of the problem. "Criminals are being caught that are more organized and more sophisticated than we ever imagined. Cases are now being prosecuted under racketeering laws, and suits are hovering in the multiple millions."

Another argument senior management might use to resist purchasing a security system is that the company is already protected against losses. But aside from the loss of reputation, which cannot be insured, as well as the fact that premiums may rise after a substantial loss, there are many other expenses to consider. Most of these are associated with the system being down for a period of time.

As BloomBecker puts it, "A company cannot insure against lost opportunities and lost customers that result from not having full use of the computer system. Those losses are almost impossible to quantify, but they are important to consider."

Swallowing the security pill

Obviously, the ideal way to install a security system is to assess the need, budget it and install it all at once. However, it is often difficult to get senior management to swallow the security pill whole.

According to Selby Wellman, vice-president of marketing at Paradyne Corp., a Largo, Fla., data encryption hardware vendor, "It's very rare that we get to install a complete security system in one fell swoop. Normally, we have to determine the most sensitive circuits and install machines on those."

The main reason for the piecemeal method is to get a company and its officers used to the need and efficiency of security systems. "Going to a company a step you have to take all at once," Prudential's Burgess says. "But after that, you can increase the sophistication of the system gradually. Probably if the money spent on a security system in Year X had been defined five years earlier, we would have had a hard time getting the system approved." A second reason for gradual implementation might be that MIS needs to avoid exceeding its spending authorization for the year.

However it's accomplished, most consultants say that corporate managers need extensive education on computer crime and security. And at this time, the group best positioned to furnish that education is MIS. ∎

> "COMPUTER crime is nothing more than white-collar crime with a new medium. Every time you train an employee on the computer, you're also training him to use that computer to rob the company."
>
> SANFORD SHERIZEN
> SECURITY CONSULTANT

Thief

with computer crimes, CCC was detected and identified by a technician at the European Center of Molecular Biology.

Various parties involved in the CCC scam place the blame differently. The hackers held a press conference to finger the operating systems' defects. Many of the companies and agencies involved admit they were lax in their security measures, relying on those in Digital Equipment Corp. VMS and Unix.

NASA's Bunt says, "There was a serious hole in VAX/VMS Releases 4.4 and 4.5." He was involved in helping discover the reason CCC was able to change files. Apparently at least one of the hackers was familiar enough with the operating system to defeat the password/function restrictions in VMS.

DEC's latest two VMS up-

Detroit Police's Campbell

grades fix those security problems, Hunt says. "At least in this one area, I think we're covered," he says.

In addition, NASA tracked down the viruses the hackers planted in the network. It is still checking for others and has ordered a reload of programs from original disks to replace those on-line during the time the network was illegally accessed.

As for the hackers, the West German and French authorities are prosecuting them under computer-crime violations, according to West German newspapers.

The Case of the Concerned Crank. A poem, a pansy, a bag of Mrs. Fields goodies and a message, "Please have a cookie and a nice day," are what she left — along with five demolished IBM mainframes.

On a Tuesday early this June, free-lance peace activist Susan "Katya" Komisaruk walked into a low-security area at Vandenberg Air Force Base in California. She does not deny that she then broke a window to enter a building and took a crowbar, wire cutters and then a fire extinguisher to the guts of five computers, according to Federal

Bureau of Investigation and Secret Service agents in both San Francisco and Los Angeles.

Komisaruk told the agents she thought she was hindering the Star Wars effort by selecting the "NAVSTAR Control Center." However, the U.S. Air Force had not taken down the old signs from what is now a storage building.

After she turned herself in,

Komisaruk was prosecuted by the state of California for trespass and destruction, reports the state prosecutor's office in Los Angeles. She was convicted on Nov. 16 and could be sentenced to up to 10 years in prison.

This type of crime should be meaningful to many MIS managers, particularly those who do not have a lock on their comput-

er room doors. Komisaruk might well have escaped scot-free had she not been determined to make it plain what she was about. She walked away from the wreckage, hitchhiked home to San Francisco from Los Angeles and turned herself in to the authorities.

The Air Force, surprisingly, is quite sanguine about it all. According to spokesman Lt. Col.

Richard Hill, the important thing is not the expensive mainframe destruction but that no damage was done to data. He says the computer system was obsolete and unused. "Eighteen months ago, that was a NAVSTAR installation," he points out, "but it was storage when she got in."

The Air Force's position is that it was not incredible that

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On Capitol Hill, loose chips sink ships

BY BUCK
BLOOMBECKER

While lacking the immediacy of the Bork hearings or the banality of the new television season, Washington, D.C.'s, fall season for computer security promises to be one of the more memorable of recent times.

Recently I scoured the halls and corridors of Washington, hunting down both obscure and well-known members of the legislative and executive branches, to ascertain what they were doing to help make the nation's computers secure.

Don't let it be said that all in our nation's capital are asleep at the keyboard. A number of significant activities are bound to conclude, and others to begin, making Washington the place to

THE government puts information security under the heading of information resource management. From office to office, IRM reigns as a buzzword. But what it means is harder to pin down.

watch for computer or security professionals curious about where federal computer security policy may lead them.

The main event: HR 145

Clearly the most significant piece of business on the computer security calendar is the fate of HR 145. Rep. Dan Glickman's (D-Kan.) bill. It is the latest volley in the continuing debate over the relationship between the National Bureau of Standards (NBS) and the National Security Agency in the development of computer security policy for the federal government.

As passed by the U.S. House of Representatives [CW, June 29], HR 145 says the NBS is to have primary responsibility for the development of computer security for all systems handling unclassified information. The bill has been modified slightly since Glickman introduced it so that it now recognizes the appropriateness of the National Security Agency's providing technical advice to the NBS.

Yet to be considered in the U.S. Senate, the bill will die unless the Senate takes action by the end of 1988.

Governmentwide support

Strong support for the thinking behind HR 145 is likely to be found by those who read "De-

fending Secrets, Sharing Data," a recent report from Congress's Office of Technology Assessment (OTA) on federal computer security policy.

The NBS also supports the bill, suggesting that it will clarify the powers and responsibilities

the NBS has held for some time in setting standards for computer security.

The NBS continues its efforts to guide the nonmilitary user community on computer security. Stuart Katzke, chief of the computer security division of the

NBS's Institute for Computer Sciences and Technology, is heading a new project designed to increase the spread of computer security information between government and private-sector participants.

The Computer and Telecommunication Security Council is currently in the planning stage. Shirley Radack, assistant to the director of the institute, says

they hope to have it organized by March 1988. The council will provide a forum to look at the issues involved in the protection of nonclassified information.

The General Accounting Office (GAO) is also involved in several studies at Glickman's request. The purpose of these studies is to determine the current status of government computer security efforts and

At Last, All the Power to Defend VM.

evaluate alternate strategies.

The GAO's most current evaluation of the strategies involved in the HR 145 debate can be found in the testimony of Thomas Gammo, associate director of the Information Management and Technology Division of the GAO. That testimony, which was delivered at an HR 145 hearing that Glickman held May 19, discussed the information security practices of nine federal agencies and found a pressing need for improvement in many of the systems considered.

A detailed report is being prepared by the GAO that will discuss the 17 agency systems that are actually reviewed. The report is currently under study, and no release date has been determined.

Underlying these questions, a senate staff aide notes, is a philosophical dispute: Is information simply a type of personal property requiring increasingly stronger safes around it, or is it an individual right requiring a different form of protection? This question, addressed some what by the OTA report mentioned above, remains to be more thoroughly discussed.

The government puts information security under the heading of information resource management (IRM). From office to office, IRM reigns as a buzzword. But what it means is harder to pin down.

Agreeing to disagree

Deborah Smith at the Office of Personnel Management (OPM) is in charge of teaching computer skills to government employees at the OPM's Washington, D.C., facility. She notes that OMB Circular A-130 mandates that each agency develop a plan for end user training or information resource management. She attended a conference a year after the circular came out and found no operative definition of information resource management available at the time. She reports no progress since.

With this lack of agreement as to the ground rules, it is not surprising that little is being done to plan for personnel competent in computer security skills, should HR 145 become law. The bill would require the OPM to engage in continued training to keep employees knowledgeable in security. Nothing is currently planned, Smith says, as far as she is aware.

Appendix III to OMB Circular A-130 establishes a set of minimum controls to be included in federal automated information systems security programs. At the end of this year, OMB will receive reports from the managers of the various federal systems on their progress in complying with the circular.

IS INFORMA-
TION simply a type
of personal property requiring increasingly stronger walls around it, or is it an individual right requiring a different form of protection?

Gail Shelton, assistant to the U.S. Department of Health and Human Services (HHS) Inspector General Richard Kusserow, reports that the latest in the HHS's series of studies concerning computer security will soon be issued.

That report, "Personnel, Suitability and Security," pursues the question of the level of personnel security in the HHS. A survey of the 41,644 people in the HHS with access to money or benefits showed that 1,265 of them had arrest records. One-third of these had their arrests, 131 had theft convictions.

Meanwhile, the Small Business Administration (SBA) is set to release a computer security guide for the small businessman. Rep. Ron Wyden (D-W.Ya.), sponsor of the bill that led to the security guide, is holding a hearing to publicize the guide's publication. The hearing is also intended to publicize IBM's participation in a joint venture with the SBA to promote computer security and computer applications for the small businessman. Rick Mayrrone, SBA project director, says 200,000 copies will be printed. ●

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Software applications put the 'byte' on crime

BY JACK BOLOGNA

Crime detection is mainly a deductive process. There are times, however, when police have to rule out more than 10,000 suspects in order to come up with one that may or may not have committed a crime.

This process of elimination is tedious and time-consuming and the kind of thing a computer can do faster, more accurately and perhaps with less bias than humans.

Detectives, therefore, are turning over an increasing amount of their investigative duties to computers so they can be free to pursue more important tasks, such as planning the investigations, locating and interviewing witnesses, interrogating suspects and searching for evidence.

Software applications that facilitate crime detection and investigation are currently hitting the market with some frequency. Designed originally as in-house solutions by local police departments, some of these can now be pur-

Bologna is assistant professor of management at Siena Heights College in Adrian, Mich., and president of Computer Protection Systems, Inc. in Plymouth, Mich.

chased, licensed or exchanged.

Some 20 organizations provide software to police agencies for crime detection and investigation, traffic safety, departmental budgeting, payroll, scheduling, dispatching, report writing, property accounting, word processing, training and personnel records. With a $5,000 budget for a personal computer

D ETECTIVES are turning over an increasing amount of their duties to computers so they can be free to pursue more important tasks, such as planning investigations, locating and interviewing witnesses, interrogating suspects and searching for evidence.

and some software applications, even a small town can modernize its police department.

What are crime detection applications intended to do? The following list is a sampling:

• Compile lists of stolen cars, securities, credit cards and other property.
• Compile lists of wanted criminals, bail jumpers and delinquent child-support payers.
• Compile lists of counterfeit securities and credit cards.

• Compile crime incident data on the basis of modus operandi. These applications are intended for specific types of crimes, such as burglary, rape, robbery and car theft.
• Compile lists of criminal associates, their common interests, haunts and criminal specialties.
• Compile lists of aliases or street names

used by criminals.
• Compile lists of fingerprints, signatures and criminal histories of convicted criminals.
• Link certain crimes with certain criminals by establishing common threads, such as common associates, convictions, mode operandi and physical characteristics.
• Compile list analysis.
• Movement analysis.

As you can imagine, these advances in police computing's state of the art do

not come without some criticism.

There is fear in the minds of some people that the use of criminal-profiling aids touches on the violation of privacy rights. Some people are concerned that profiling can lead to the categorization of people as associates of criminals when the contact was, in fact, innocent, familial or accidental.

These privacy issues concern professional law enforcement agents, as well. Their answer is that great care is taken to safeguard such systems and their data bases in order to ensure that access is restricted to those who have a real need to know.

As the automation of crime detection and investigation grows, police users groups are forming to promote computer usage and software exchange.

One such group is Public Safety Micro-Software International, headed by Doug Johnson of the Madera, Calif., police department. Johnson reports that for a modest annual membership fee of $105, members receive a newsletter and exchange copies of software that various police departments have developed.

Another such contact is Bill Clede, who serves as technical editor and a regular columnist for *Law and Order* magazine in Wilmette, Ill. •

Thief

Komisaruk got on the base, in the building and away undetected. Hill notes that a major highway bisects the base and "after all, Vandenberg is 98,000 acres."

He adds that security on the base is in direct proportion to the nature of the project. High security at the Air Force base involves fences, armed guards, locked doors, codes to punch in — all before you can even touch a computer, which will have its own set of security procedures, Hill says.

Regardless of all that, Hill adds that Vandenberg has reassessed its security procedures in light of the incident. "We

are in that business," he says.

The Insidious Insider Intrigue. If you cannot trust your bunkers — internal and external — what's a multibillion-mark company to do? Yet, Volkswagen AG in Wolfsburg, West Germany, operated as most multinationals do and trusted its internal currency traders and the products from its major banks. Computerization is the key to keeping a profitable money spread in international markets, and traders and banks are the professionals that allow quick response to rising and falling currency.

What happened at VW last spring is that traders saw their chance to play with a few dollars — $259 million, to be exact — in currency futures, according to ou-

merous articles in the daily and business presses. The crime befit the size of the company. It required double insiders — traders and programmers.

On the computer side of the fraud, trading programs had to accept a much looser set of exception criteria for trading. Also, recordings of the actual transactions were erased. Nontrading managers could not be alerted to discrepancies until profits built up. On the more traditional side of the fraudulence, contracts allowing trades through the National Bank of Hungary were forged.

As long as the contracted currencies went the right way, VW profited and the conspirators skimmed off their portion, according to a report from an outside auditor VW hired to analyze the crime. How-

ever, fluctuations in the U.S. dollar skewed the outcome. The schemers cashed the contracts, and VW took the loss. VW will not reveal the exact nature of the problems or their fixes.

Audits eventually uncovered the discrepancies in the VW case. First outsiders and then insiders were identified and sued or arrested. The chief currency trader, Burkhard Junger, confessed complicity and admits forging the contracts. He was fired. But VW's Chief Financial Officer Rolf Selowsky took the fall.

The prosecution continues, with at least three VW currency traders indicted. In September, the courts dismissed VW's claim that the Hungarian bank was at fault, and, according to reports from the *Wall Street Journal*, it appears VW will have to swallow the losses.

How did it happen? Neither VW America nor its headquarters is willing to talk until the various criminal and civil trials are over, but it is clear that the management and computer control systems were inadequate. The crime may be the largest corporate fraud ever.

Consultants say that such insider manipulation of programs and data requires

Air Force's Hill

considerable and varied defenses. The first is exception-reporting software that tracks all financial transactions and regularly reports those exceeding limits to management. The need for this type of measure seems to be well recognized, and an increasing number of vendors offer such programs to be installed in corporate computers.

That type of product may well have caught crime similar to VW's — albeit on a smaller scale — earlier, but VW's clever inside/outside combination was willing and able to bypass such safeguards. In such situations, the best deterrence may be to let white-collar employees know that a variety of audit and overlook capabilities are in place.

Besides discrepancy reporting, such measures include automatic verification and recording of who is accessing which files when. Numerous companies provide logging software, although even these aids are not always used to advantage, according to security consultant Bologna. He recalls a new client who had years of such records yet never examined them.

Bologna cites security monitors from Absolute Security, Inc. in Maynard, Mass. The Intel Corp. 80286-based systems link to mainframes or PC networks. They record who enters what files when and can be programmed to check for specific types of alterations. In some cases, this means comparing the contents of the payroll file with a predefined set of data or an algorithm every 20 minutes. The

security manager would be alerted when certain types of changes were made.

While VW is not talking at this time about specific preventative measures it is taking, Bologna notes that the company had better look to the right kind of technological fixes. "Volkswagen could have adopted exception-reporting software that gives the system a chance to audit itself," he says. For a huge company, this procedure must include user profiles, with immediate reports when these get out of sync. "Ultimately, the system has to start auditing itself," Bologna says.

The Call-Code Conundrum. Last July, the Santa Clara police and the U.S. Secret Service arrested and ultimately charged Paul Lindahl and his assistant with stealing 800 telephone authorization codes from U.S. Sprint Communications Co. through the company's Unix-based systems. The Secret Service says Lindahl subsequently discounted and sold the code use to unsuspecting customers. He called his fake service California Discall. The agencies estimate the loss to Sprint at $5 million.

The illegal codes were rotated daily, making detection harder, according to police files. The scheme was revealed when Lindahl's operation solicited Sprint customers, who, in turn, notified that company, Secret Service agents say.

The basic ploy in this crime is all too simple. An adult DP pirate or even an unsophisticated teenage hacker need only a PC, a modem and a telephone line.

The system is set to dial codes on the long-distance service's access line. Eventually, it gets a dial tone, or as they say in the trade, "jackpots a number." Various law enforcement agencies and savvy consultants estimate that U.S. companies lose $500 million annually by such fraudulently obtained codes.

Sprint recently wised up to these schemes, and people hacking on its service will now get far less return on their time and money investment. Some relatively simple technological fixes may limit the trafficking in authorization codes.

One of the simplest measures, which uses old math, may be the most effective. Sprint is changing its seven- and nine-digit user codes to 14-digit ones, except in a few regulated locations in which they must get permission to do so. Like adding numbers to a safe's combination, this will require a great deal more computerized dialing for a jackpot. Whereas an untended dialing PC might produce dozens or even hundreds of codes in a session when seven to nine digits are used, the longer codes may yield only one or two jackpots — possibly too low a return on investment for pirates.

"We're going beyond getting away from our old authorization codes," says Sprint spokesman Syd Courson.

To counteract the image of Sprint as an easy hit — when initially asked about the hacking of codes, Courson's immediate response was to ask *which incident* — he says the firm is prosecuting pirates and trying to publicize the fact. Unlike banks, which will not discuss these incidents and would rather fire culprits than prosecute and draw attention to themselves, Sprint wants to scare code thieves.

"Some of these people are already serving time, and we are cooperating with ongoing investigations, mostly with the Secret Service," Courson says. "We want them to serve jail or prison time. Whenev-

er we can, we're starting civil actions as well and going after their pocketbooks."

A Secret Service agent involved in a number of such cases says there is more than just a code problem. "AT&T has maybe 90% of the business and only 10% of the fraud," says San Francisco-based Richard McDrew. "That's no accident. They have internal control on how they issue numbers."

McDrew adds that, typically, such security breaches can be traced to management. "In the Lindahl case, there were problems in their applications procedures and how they gave out numbers," McDrew adds.

As for the passwords themselves, they are essential but not adequate by themselves, says Frank Smith, co-director of

security services at Ernst & Whinney in Cleveland. For internal users, he suggests that passwords be combined with other technologies, such as keyboard dynamics, hand or voice prints or retina pattern recognition.

"In openly architected systems, the fundamental problem is ensuring that the user actually is who you think it is," Smith says.

In dial-in systems, Smith cautions companies that "passwords are only alphanumerics of fixed length and take merely repetitive penetration to jackpot." He states that "the very least a dial system should have is three invalid tries and suspend the log in."

Bologna notes that "only those organizations that have been recently and badly

burned are up to date." Buck Bloom-Becker, director of the National Center for Computer Crime Data in Los Angeles, adds, "There is an enormous spectrum of security consciousness from the banks, on one end, to startup companies on the other."

It is up to each individual company to maintain that balance between ease of use and security, BloomBecker says. "There is also a spectrum of prevention, with the expectable trade-offs in ease of use."

However, BloomBecker is quick to point out that in some cases, such as with systems programmers or autonomous information workers, there is no such thing as total security. "The best way to prevent computer crime is still good management and happy workers." ◆

'Let's see, word publishing, desktop processing — no . . .'

It used to be simple enough to tell them apart

BY JEFFREY SUTTON

Once upon a time, there were two markets: word processing and desktop publishing. Word processing let secretaries and writers type in and edit words with varying degrees of sophistication. Desktop publishing allowed graphic artists and designers to mix text and graphics.

And the two markets lived happily ever after. Right?

Wrong. Word processing and desktop publishing are encroaching on each other's territory. With the increasing sophistication of personal computer-based word processors and the proliferation of laser printers, the distinction between word-processed and published documents is considerably blurred.

It used to be simple enough to distinguish word-processed from typeset documents. You could print a word-processed file on a daisywheel or dot matrix printer or have it typeset. If so inclined, you could embed complicated typesetting codes in your text files and send the files directly to a typesetter.

Desktop publishing used to mean using a 512K-byte Apple Computer, Inc. Macintosh bundled with Apple's Laserwriter and embellished with Aldus Corp.'s Pagemaker.

The operative words are "used to." As laser printers dropped in price and more processors added downstream. Then, end users, with these tools alone, began to produce near-typeset-quality documents, complete with graphics. Thus ended the fairy tale of two separate markets.

Word processing is still the technology of choice for the majority of users; its market is large and mature. The market for desktop publishing is modest, but it is growing rapidly; especially when you consider that it emerged as late as 1985, when Apple released the Laserwriter and the Mac 512K (see story page 91).

The number of word processing packages sold has remained relatively stable for the past four years, hovering close to the three million mark. By contrast, the estimated number of desktop publishing software packages sold in 1987 ranges from 137,000 to 250,000 units, according to estimates by Dataquest, Inc., based in San Jose, Calif. This market has doubled each year since 1985 (see charts page 91).

But as the boundaries continue to blur, it soon will be tough to count the units sold separately. George Elgar writes in his "Microcrews/Views" newsletter that he expects the next desktop publishing sensation to be Wordperfect, a word processing package from Wordperfect Corp.

Trading places

What does all this mean to users?

For one thing, it means that many word processing packages now offer features comparable to those of Pagemaker on the Macintosh. Today, high-end word processors offer a variety of fonts, the ability to mix text and graphics, multiple columns, style sheets and other advanced features commonly associated with desktop publishing.

Arlene Karub, director of publishing systems market analysis at CAP International, Inc. in Marshfield, Mass., says word processors are moving toward "better management of fonts, better integration of graphics and better integration of scanned images."

Karub says she is seeing in PC-based word processing the "ongoing addition of publishing attributes — hyphenation, fonts, graphics, images, style sheets and structured page layouts."

In a parallel movement, Karub says, she sees desktop publishing packages enhancing their word processing features by adding spelling checkers and

Sutton is a free-lance writer based in Warwick, R.I.

BART GOLDMAN

- **Boundaries have begun to blur**
- **Is 'dynamic overlap' good for customers?**
- **Give end users the kerning test**

better facilities for inputting and editing text. Each raids the other's cookie jar, resulting in "a lot of dynamic overlap between the two," she adds.

In a recent and-user survey, Karsh reports, "we found a lot of people who said they were doing publishing, particularly of long documents, and they were using Microsoft Word to do it."

Word processing will continue to permeate the desktop publishing realm — heralding good news for end users. The battle between word processing and desktop publishing vendors provides end users with products of better quality at a lower price. Such healthy competition raises performance and lowers cost in true market-driven style.

'Very concerned'

Are desktop publishers after a piece of the word processing market's pie? They say no. Nor do the word processing vendors admit to being after the desktop publishers' market.

Despite these claims, Dataquest analyst Richard Young says word processing vendors are nervous about the competition from desktop publishing and that they are fighting to protect their market.

"I think high-end word processing vendors are very concerned about having their lunch eaten by these other products," Young says. In his opinion, these vendors are afraid of being perceived as no longer being on the leading edge of their own technology.

High-end vendors' fight to retain domination will lead to further market confusion, with every word processing vendor trying to jump on the desktop publishing bandwagon, Young claims. "The word processing vendors are going to tend to confuse things as much as possible," he warns, "by showing output that looks like what comes off a

desktop publishing product. Marketing [literature] is going to say, 'We do desktop publishing.' "

Who's to blame?

What is the catalyst of this confusion? The mighty laser printer, the spearhead of the desktop publishing revolution. Because the print quality from word processing and desktop publishing

Rising star

Sales of desktop publishing packages for PCs have more than doubled each year in North America

INFORMATION PROVIDED BY
DATAQUEST, INC.
CW CHART

programs can now look identical, it is difficult for users to differentiate among packages.

Ronni Marshak, managing editor at Patricia Seybold's Office Computing Group in Boston, surmises that "a lot of users who thought they needed desktop publishing will find they don't" (see story page 92).

According to Young, disorder also stems from end users' lack of knowledge of the fundamental characteristics of the task they are trying to automate.

Young tells a story of wrestling with the first release of Pagemaker in 1985 while working as a systems analyst at Boeing Computer Services in Se-

attle. Why the struggle? He had chosen the wrong tool. The Boeing documentation project required using a book-oriented program, not Pagemaker's page-oriented approach.

Where does the blame for applications leave the end user in terms of buying decisions? The answer varies according to the users' current software and hardware bases, the investment in employee training, the skill level of employees and, not least, the kind of output required.

Some end users require full desktop publishing packages; others' needs can be met by high-end word processors. Commonly, a company will use several products.

D. L. Hiller & Associates, Inc., a systems integration and consulting firm based in Sterling Heights, Mich., uses both word processing and desktop publishing extensively to produce documents for its clients. President Dean Hiller reports that his company uses Microsoft Corp.'s Word and an AST Research, Inc. Turbolaser printer to produce proposals for clients.

In addition, the company has standardized on Microsoft Word for correspondence and other kinds of writing.

When Hiller needs high-quality documents fast, word processing is his choice. When he needs a high-quality document with complex graphics, he turns to desktop publishing. Hiller says Ventura Publisher from Xerox Corp. would be far too slow to run off four quick proposals for a client. The proposals are standardized and, therefore, contain about 50 pages of boilerplate information.

But for presentations, Hiller says, his firm relies on Ventura Publisher. Users create diagrams of terminals, PCs and network components with Autodesk, Inc.'s Autocad, then call them up in Ventura Publisher and add text, titles and subtitles.

Hiller cites Ventura Publisher's two primary advantages as being the ability to pull in these graphical inputs from an array of sources and the ability to crop the graphics to the right size.

Nancy Carlin, MIS manager at FNS Sales, Inc. in Rochester, N.Y., says her company produces technical manuals using NROFF, a popular Unix page-formatting system from AT&T Information Systems. At the same time, the company is moving toward in-house desktop publishing. FNS currently uses Apple Macdraw-like packages on IBM Personal Computers to generate page layouts for advertisements. These are then sent to an outside ad agency for typesetting.

Carlin notes that her company's move toward desktop publishing will not exclude word processing. "End users are allowed to use what they want," she says. They currently run word

processing packages, including Wordperfect and Micropro International Corp.'s Wordstar on an AT&T 3B1 system.

'As integrated as I wish'

Hiller dismisses the notion that the word processing and desktop publishing markets will merge, claiming that an integrated system of sorts is possible right now by doing production work in Word and then loading the documents you wish to enhance into the Ventura Publisher package.

"When I stand there with Microsoft Word on the shelf and Ventura Publisher next to it," he says, "I feel I'm about as integrated as I wish to get."

Cash cow

Personal computer-based word processing software is a hefty, stable market — nearly three million units are sold in North America each year

UNITS SOLD

	2.5M	3.0M	3.2M
1985	'86	'87

*Estimated

INFORMATION PROVIDED BY
DATAQUEST, INC.
CW CHART

Dataquest's Young says word processing and desktop publishing should remain separate. "I would rather see a hot link between the composition package and the source file," he says.

While only rudimentary links are available now, the day is not far off when sophisticated links will allow end users to transfer files between applications with no loss of formatting, thus providing true multitasking capabilities. Loading separate applications, such as the graphics editor and the data editor, into memory will "flow each module to operate under a single umbrella, providing a consistent level of interactivity.

Word processing's pluses

Most industry observers say end users will make use of both kinds of software, using whichever is

more appropriate for the task at hand. However, word processing packages have a decided advantage in several respects:

• There is a huge installed base of word processing users. Many companies have a major stake in word processing software, both in existing data bases of text and in training. For this reason, many firms will continue to rely on their word processors and just add laser printers.

• High-end word processors are mature, strong offerings. Peter Dyson, editor of "The Seybold Report on Desktop Publishing," says that "the very finest word processors have functionality that, in some respects, is better than desktop publishing."

Besides being able to perform basic page layout functions such as arranging text in blocks or columns and incorporating graphics, word processors feature the speed and solid text-editing functions missing from most desktop publishing programs.

• Word processing software can be easier to use than desktop publishing software.

• Most of the top desktop publishing systems have links, albeit rudimentary, to the high-end word processors.

Office automation key

Perhaps new markets will emerge and both markets will win. The office automation market is one key to this outcome.

Young says, "The distribution capabilities offered by office automation tools are going to provide a vehicle to facilitate the movement of information between desktop publishing and word processing."

As Young envisions it, a document would travel along an electronic path. At each workstation, various writers, editors and graphic artists would add value. The vendor that can be the systems integrator stands to profit considerably. "I think that's why Wang, DEC and IBM are now all in this market," he says, "because they see themselves as providing that hub."

Users would benefit tremendously; should such a seamless approach be realized. "Interoperability is a strategic, corporate

One good Apple

W
hen it comes to desktop publishing, the Macintosh is usually the apple of users' eyes. Apple Computer, Inc., with the Macintosh and Laserwriter, continues to be perceived by many as the desktop publishing company of choice. It is common to find a few islands of Macintoshes in a sea of blue.

For example, Joseph Gismelli, vice-president of MIS for Toys R Us, Inc., says his firm uses IBM's Displaywrite 4 because "it gives us the ability to interconnect around the world." He reports equip-

ing desktop publishing experiments in composition and layout in his company's Canadian offices. Their computer? A Macintosh, of course.

Users choose Apple for its ease of use and software capability. Dataquest, Inc. analyst Richard Young says, "The Mac still has about an 18-month edge on the MS-DOS world. If they play this to their advantage, they will continue to do very well."

By contrast, he continues, "IBM can make lots of mistakes. But Apple could be dislodged very quickly by making a few stupid errors."

JEFFREY SUTTON

imperative," echoes David J. Becker, manager of automation resources at Boeing Support Division in Seattle, a separate operating company of The Boeing Co.

Note the difference

Most observers agree on the features that distinguish the two types of software and those that make one more appropriate for a particular task. Text entry and editing form the core of word processing, with a myriad of authoring tools such as a thesaurus or spelling checker thrown in.

The consensus among experts is that desktop publishing software generally includes a "what-you-see-is-what-you-get" (WYSIWYG) display, the ability to mix text and graphics, precise control of page layout and such typographic niceties as kerning, reverse faces, dropped caps and horizontal and vertical rules.

Dyson notes that whereas both desktop publishing and word processing can integrate text and graphics on a page, what differentiates them is the degree of sophistication of typographic control. "Typically, word processors don't have too much concern for kerning, variable point size or variable leading," he says. When they do offer these features, the increments between sizes constitute "fairly crude jumps," he adds.

Two kinds of publishing

The buying dilemma does not end with deciding on desktop publishing over word processing. Just as there are clear differences between word processing and desktop publishing systems, there are also different types of products in the desktop publishing market.

Dataquest's Young divides the desktop publishing market into two camps.

The first is the page-layout approach as epitomized by Aldus's Pagemaker, which uses the cut-and-paste metaphor of the designer as its interface. This is a "total graphics environment, very fluid, not line-oriented," he says. The second, Young continues, is typified by Ventura Publisher, with its "tag-based or designator-based approach providing you with a true-structured document."

Pagemaker excels at laying out single pages with great typographic precision, whereas Ventura Publisher is the tool of choice for long documents, such as technical manuals.

As if that were not enough, there is a hybrid type: compound document processors. These packages — half word processor, half desktop publisher — mix text and graphics, and they can produce very long documents.

It is in the gray area of compound-document processing that the lines separating word processing from desktop publishing truly vanish. And it is here that users may be confused as to what product they need. Likewise, it is in this band of the market that the high-end word processors and desktop publishers may meet head-on.

Products such as Ventura Publisher qualify as compound-document processors, but, interestingly, so do several high-end word processors, including Microsoft Word Version 4.0 and Lotus Development Corp.'s Manuscript.

It all depends on how you define "long document." Jeffrey Sanderson, a product manager in the applications group at Microsoft, defines a compound-document processor as a product that handles long *Continued on next page*

In publishing, it's the look that counts

D o most users really need desktop publishing packages? Richard Treitman, director of document products at Lotus Development Corp., tells the story of a retailer who asks customers if they need kerning. If their response is, "Huh?" then he does not sell them Ventura Publisher from Xerox Corp. or Aldus Corp.'s Pagemaker.

A factor driving the proliferation of desktop publishing is a change in people's esthetic perception, largely due to the entrance of the laser printer.

Bob Hicks, marketing manager at Norwell, Mass.-based Serono Diagnostics, Inc., a $35 million business serving the clinical market, says two-column output lends credence to documents because it gives the look of scientific journals.

"I can type something up and put it on stationary, and it can be scientifically valid as hell, and people don't look at it,"

he says. But when he produces the same document with desktop publishing tools, Hicks claims, people will at least read it and judge it on its scientific merits.

Allan Ayars, manager of desktop publishing product marketing at Xerox, says, "Desktop publishing becomes a very powerful finishing tool because it makes a document 'decisionable.' Management has both summary and detail built into the same document."

JEFFREY SUTTON

Which one's the artist here?

Desktop publishing is now so-phisticated enough to allow any end user to create complex page formats, complete with graphics. While this pleases some users, it distresses others.

From a management viewpoint, as analyst Rick Young at Dataquest, Inc. puts it, "You may have writers that like to diddle around with those things, but you don't want them to."

Arlene Karsh, director of publishing systems market analysis at CAP International, Inc., asks, "Do people creating documents want to deal with formatting? Or is it not their job just to write?"

Not all managers view the availability of desktop-publishing tools with foreboding. H. William Howard, vice-president of information services at Bechtel Power Corp. in San Francisco, reports, "We've got secretaries using these packages with no training. Give it to them and let them play with it," he says.

Of course, some writers are devoted to their word processors. John Hild, president of Xyquest, Inc., maker of Xywrite III, says that package's popularity stems from how it can be tuned specifically to the task of authoring.

Jeff Sanderson, product manager in the applications group at Microsoft Corp., agrees. "The production people are the ones that should worry about graphic design," he says.

JEFFREY SUTTON

Desktop

documents that need to mix text and graphics.

While 50 pages typically constitutes a long document, page length alone is not always the determining factor in using a compound-document processor. The extent to which you must mix text and graphics bears equal consideration.

At present, Sanderson says, a long document such as a 1,000-page manual for the Boeing 747 would require a system like Interleaf Corp.'s Interleaf, a high-end document-publishing workstation with complete tools for writing documents and creating graphics.

But Sanderson predicts that in the future such documents will be produced on an Interleaf-like system on a Macintosh or an IBM PC. A version of Interleaf already runs on a Mac II; however, it is expensive and uses 4M bytes of memory.

Pam Bliss, a Dataquest research analyst, says that as early as next year, we will start to see integrated packages on PCs that resemble high-end publishing systems such as those offered by Interleaf, Xyvision, Inc., Compugraphic Corp. and Zenox. These systems will offer text editing, graphics creation and composition and pagination features in a single package, with different modules of the system running in separate windows.

Such systems presuppose the use of multitasking PCs. Bliss says IBM, Digital Equipment Corp., Hewlett-Packard Co. and Wang Laboratories, Inc. have all offered Pagemaker on their PCs. But she suggests that this is an interim solution.

There will always be . . .

As long as authors demand speedy, feature-filled word processors and don't want to bother with cumbersome page layout tools, there will be a demand for word processors. As long as graphic artists and designers want high-level page layout tools, there will be a need for desktop publishing software (see story above).

Noting that 80% of all end users do some type of word processing, Microsoft's Sanderson scoffs at the idea that there is one product for the whole sector of users.

Allan Ayars, manager of desktop publishing product marketing at Xerox, sums it up. "There is plenty of room for everybody. You start to get this synergistic effect where the market grows rapidly as a result of everybody starting to set new standards and new expectations."

How will the two tools evolve? CAP International's Karsh says, "There will be long-document production kinds of tools that look like word processors but also allow end users to deal with formats — like Microsoft Word as a Mac or Microsoft Word under Windows."

Karsh predicts there will be other tools, in distributed document-production work groups, that divide the tasks. In this scenario, "authors are doing authoring, editors are doing editing, page-layout people are doing page layout," she says.

Citing the ready availability of laser writers, let-mapped screens and graphics cards, Seybold's Marshak says she expects desktop publishing to become a niche market that will merge with typesetting, computer-aided design and manufacturing systems like Texet Corp. and Camex, Inc. of the very high end of the publishing world. •

MANAGEMENT

You better shop around

"Account control means that a certain vendor should be part of any equipment decision a customer makes, and in most cases, it will be a foregone conclusion that the vendor will get the business." Such was the definition of account control offered by an executive for a third-party maintenance company.

That kind of assessment should leave MIS managers concerned with how they should react to a variety of recent moves by IBM geared toward reasserting account control.

For IBM, sales is the key to success, and account control is the key to sales. Account control is to sales what mass production is to manufacturing: It generates economies of scale that make many sales require comparatively little effort.

Looking at its recent slow years, IBM has apparently come to the conclusion that its account control has been slipping. Encroachments by DEC, plug-compatible manufacturers and third-party maintenance companies have put into doubt at some accounts the forgone conclusion that Big Blue will get

Continued on page 101

Catching new clients

Blue Cross leader diagnoses DP operation's ills

BY MICHAEL
SULLIVAN-TRAINOR
CW STAFF

PROFILE
Bill Skowyra

When Bill Skowyra resurrected an expert system claims processing application that had been abandoned by his predecessor, the last thing on his mind was making end users more productive.

Instead, the senior vice-president of information systems at Blue Cross/Blue Shield of Missouri used the mainframe software to capture the company's first national health insurance accounts, including IBM.

"He created a position of leadership for the company," says Bob Shupe, senior vice-president of operations for Blue Cross/Blue Shield. "We had a systems capability and the people to support it, and Bill capitalized on that."

It was six years ago that Skowyra first applied the power of his aggressive personality to a vision of a new role for information systems, propelling his company into the national health insurance spotlight.

Today, his competitive drive has led to the formation of a new corporation, a St. Louis-based spin-off of his information systems division called BPS, Inc. BPS will market third-party claims administration services to companies nationwide, providing clients with a single source of claims processing. Skowyra is a member of the company's administrative board.

"Bill never reaches a level of

Problem: Senior vice-president of information systems, Blue Cross/Blue Shield of Missouri.
Mission: Bringing his information systems organization out of the back office and into a position of increased leadership.

complacency," Shupe continues. "He is always going to be to improve on where he is or where the company is. He has a strong desire to keep a leading-edge position, and that is a burning flame inside him."

Colleagues also note, however, that Skowyra faces the challenge of communicating his vision to those outside his organization.

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Inside:
■ China faces shortage of DP pros. Page 101.
■ European auditors focus on security. Page 103.

Balancing controls against freedoms

BY BARBARA SEHR
SPECIAL TO CW

Reviewing employees' performance, purely a manager's favorite task, is often particularly daunting when programmers are the subject of reviews. Managers must somehow control these creative workers while rewarding abilities that might be in scarce supply.

But the performance review can be an important tool in inspiring the loyalty of MIS employees, says Douglas H. Dolton, vice-president of operations at United Savings Bank in Reston, Va. "You have to know what appeals to them, what motivates them," he says.

With creative workers, a liberal interpretation of the corporate culture often provides an incentive for productivity, Dolton adds. "Personally, I find that performance reviews in terms of things like corporate policies and punctuality are measured much more liberally for these individuals. In some cases, the ability to come to work without a tie is worth $2,000 in annual salary to a productive employee."

A lax view of corporate culture notwithstanding, the most

important requirement for reviewing the performance of creative employees is a set of clearly written criteria by which the employees will be judged, according to John Clarke, a senior consultant with Positive Support Review, Inc., a Los Angeles-based management consulting firm. "Nebulous criteria are always

KEVIN POPE

subject to failure," he says.

Dolton contends there are some people who simply work better without structure, while others work better in an environment in which all the rules are expressed clearly.

But Clarke says it is virtually impossible for an MIS shop to succeed with such a laissez-faire attitude. "You cannot operate in a vacuum," he says. "A project is usually a team effort,

Continued on page 100

How to install our office

How to expand our office

The Hewlett-Packard StarLAN office networking system works along the same lines as your existing phone system.

So where the phones go, your PCs can go.

It's a system with built-in flexibility, because the twisted pair wiring you need to plug into is often already in place.

So it's an altogether more accommodating and cheaper idea than coaxial PC networks, such as Thinwire Ethernet.

And, of course, HP StarLAN is based on the IEEE 802.3 industry standard.

Catching clients

ization and that his quick pace can lead to missteps and can be difficult to keep up with.

The spark that energizes Skowyra is a commitment to bringing himself and his organization out of the back office. "The day has got to come when the rest of this corporation will look to information systems for leadership," Skowyra says.

This goal corresponds to a personal desire to be recognized as a corporate executive rather than a "techie."

"When I was a systems programmer and, eventually, manager of technical support, I can remember people using the phrase 'techie,' " he says. "I'm not going to spend the rest of my life with a red T stamped on my forehead. And even though I've moved up the ladder to senior vice-president, when you put MIS, IS or EDP there as well, there is still that perception, 'Those crazy DP guys; they don't know anything.' "

From marketing to DP

Not harboring a lifelong desire to be an information systems manager, Skowyra graduated from the University of Massachusetts — Amherst in 1967 with a degree in political science. He was then recruited by insurance companies in the region for a position in marketing.

"I took a computer skills test for Aetna Life & Casualty, and I thought it would be more fun. It also paid more," he says.

After a two-year stint as a technical consultant at Aetna, Skowyra moved to Milwaukee, where he worked for four years as a systems programmer and data base administrator for Associated Hospital Service, Inc.

Fourteen years ago, he joined Blue Cross/Blue Shield of Missouri as a systems programmer. Working his way through the information systems organization, Skowyra became manager of technical services, assistant director of computer services, special projects director and, finally, vice-president of MIS.

"I ended up in management. If you look at management, management is sales," he says. "You have to sell your ideas and sell your people on your ideas as well as their ideas."

Relying on his marketing savvy and competitiveness, Skowyra built an information systems organization that broke the traditional mold.

"We have an account and a product focus — not a functional focus," he says. "We're not trying to be the slickest producer of insurance identifications, and we don't spend much time looking at productivity issues for our end-user departments because that is a dime on the dollar."

Most of Blue Cross/Blue Shield's revenue is derived from premium dues, Skowyra says. Ninety percent of that income is used to pay claims, and of the 10% that is left over, 8% is used for operating expenses. The remaining 2% is placed in reserve or counted as profit.

"If we built computer systems that attacked that 7 or 8 cents on the dollar, we'd be crazy," he says. "What we ought to do is build computer systems that can influence that 90 cents."

Skowyra sees the role of the traditional information systems executive as that of a scapegoat. "If he doesn't report directly to the CEO, the DP executive will be the last one in on ideas, and he won't

have ownership. So he ends up putting in chargeback systems and relying on structured methodologies and steering committee after steering committee."

At Blue Cross/Blue Shield, it is not uncommon for information systems to be on the early decisions of business strategy. In fact, Skowyra will disagree with business plans if he deems them unwise. "We've had new end-user executives come in who were used to DP being in the back office, and it is a little adjustment for them to sit there while the EDP executive says he's not sure he wants to go along with the plan because there's no business incentive," Skowyra says.

Occasionally, Skowyra's attitude gets him in trouble. "Still, in his aggressiveness, sometimes doesn't cover all his bases," Shupe says. "He leaves some bases untagged as his haste to get to that end line."

One significant mistake Skowyra has made is developing a marketing-driven information services department is to not

> **M**ANAGEMENT is sales. You have to sell your ideas and sell your people on your ideas as well as their ideas."
>
> BILL SKOWYRA
> BLUE CROSS/BLUE SHIELD
> OF MISSOURI

explain his aims sufficiently to end users.

"In the last three or four years of transition, we really didn't sell our goals enough," he says. "We did not spend enough time educating the other 1,100 people here about what we were up to. That put some distance between us and them. Now we're on a public relations campaign to address that."

Users were more concerned about Skowyra's division moving onto their turf than they were about his people failing to provide adequate support, according to some end-user executives.

Some users, on the other hand, like Skowyra's expansive approach. "The performance of the information systems operation is one of the things that attracted me to the company," says Chief Financial Officer Mike Rains, who joined Blue Cross/Blue Shield in March. "I've been places where you describe what you want and you get back excuses as to why it can't be delivered. Here, they take it and they figure out how to get it done."

As a manager, Skowyra provides inspiration and direction for his staff, while expecting results. Teamwork is important to Skowyra, according to Ed Tenbolder, vice-president for national delivery systems, who has worked under Skowyra for many years. "He prides himself on building an organization that uses the ideas of his folks, but he is clearly the leader. He can be very demanding, and that's difficult at times."

Unlike some managers, who delegate responsibility and walk away from the project, Skowyra follows the work of his subordinates closely. "One of the things I admire most about him is that, with Bill, there are no excuses," Tenbolder says.

Bill Skowyra *leads strategic MIS efforts that help his firm attract new business.*

To create his organization, Skowyra conducted a "youth movement," hiring staff members who were not prejudiced by preconceptions about the role of information services. "With a young staff, you have to listen more," he says. "With the amount of time I spend away from the floor, if I don't listen, we're not going to move on and develop our business."

The challenge Skowyra faces now is to communicate his vision of the future to others.

"Bill has a vision for where things are going that puts him at a strategic advantage, but not everyone is going down the same road with the same level of thinking," Shupe says. "You have a tendency to be feet, yards and sometimes miles behind in one direction or another. Some of that gets lost in a communication gap."

But, Shupe adds, Skowyra "gets an awesome pace that is more often found with success than with failure."

$5,000 prize up for grabs in SIM contest

The Society for Information Management (SIM) is accepting submissions for its annual juried paper awards competition, aimed at recognizing outstanding work by senior practitioners in the field of information services.

The award for the winning paper is $5,000, and as much as $5,000 is to be split among runners-up. The winning submission will be published in *MIS Quarterly*. Other finalists will be considered for publication there as well.

Papers must describe a management information system, an approach to developing information systems or a technique for improving the management of MIS activities.

The work that is described in the paper submitted must be implemented and must also have made a significant impact on the organization. In addition, the primary author should be a manager in the organization.

Abstracts no longer than 1,000 words must be received by SIM by Feb. 15.

All submissions should be sent to Scott Dzysbargh, Deluxe Data Systems, 8801 N. Kilder Court, Brown Deer, Wis. 53209.

WE CAN'T BEAT IBM AT THIS:

Balancing

and management must keep informed if the project is going well, if there are problems and if there need to be changes."

In setting standards with which to review the performance of programmers, some MIS managers are focusing on programmers' productivity in producing functional systems rather than on their raw output.

According to James Johnson,

Douglas Dolton

manager of corporate applications at Marine Midland Bank NA in Buffalo, N.Y., there is one key element to evaluating the performance of those who program the bank's computers. "The bottom line is the amount of function a system brings to a particular user," he says.

Performance for programmers cannot be measured in lines of code, Johnson adds. At Marine Midland, it is gauged through a function-point analysis that measures the accomplishments of an entire team against established criteria for such measures as development time, errors and ultimate functionality.

Johnson agrees with the need to provide a clear outline of the expectations for each employ-

THE BOTTOM line is the amount of function a system brings to a particular user."

JAMES JOHNSON
MARINE MIDLAND
BANK NA

ee's job. He emphasizes that the function systems bring to users must be evaluated on an ongoing basis, not simply as an annual measure.

Wil Creed, vice-president of information systems at Electrolux Corp. in Atlanta, agrees that

time is a much more important measure of a programmer's performance than lines of code. The amount of time taken to reach an expressed objective, such as an error-free, usable program, can be a more precise measure of individual productivity, he says.

Creed points out, however, that he also puts great stock in traditions such as punctuality and adherence to corporate policy when reviewing his MIS staff. "We've been fortunate in our recruiting efforts to attract the kind of people who share our beliefs," Creed adds.

Tradition takes a backseat at Microsoft Corp. in Redmond, Wash., where employees with shoulder-length hair often startle visiting executives as they

Will Creed

juggle on the front lawn between moonlit creative sessions.

But results still take precedence over process in some reviews there, according to Charles Golder, who directs a

group of technical writers that produces documentation for application software. "The bottom line of all of our effort is still the corporate health," Golder says. "We're in the business of creativity for money."

He admits creativity is hard to quantify and that at Microsoft, too, a functional product is the goal. What he encourages and applauds employees willing to take risks, he must also take into account the times risks turn out to be failures. "Sometimes a dramatic change in documentation may look great to us, but the audience may look at it differently," he says.

Sehr is a free-lance writer based in Seattle.

Sugaring the pill: Review dos and don'ts

BY KELLY SHEA
CW STAFF

You don't have to leave performance reviews. With clear goals and positive questions, MIS managers can make it through employee appraisals with a minimum of pain.

The following review dos and don'ts are offered by Marilyn Moats Kennedy, managing partner of Career Strategies, a management consulting firm in Wilmette, Ill.

- Make it clear that it is the employee's responsibility to keep track of what he has accomplished. The employee should not come to the review with a list of all the failures the employee has undergone. In many cases, Kennedy says, "Self-appraisal produces more job growth and satisfaction than feedback from management."

- Ask pointed questions that require the employee to honestly assess his productivity and how it relates to the department's productivity. The manager should ask the employee what contribution he has made to productivity of the department and what plans he has for increasing his productivity and continuing his education.

Be prepared to help the employee answer these questions. If he does not have a response, make suggestions that may prompt him to come up with some.

- Don't feel the need to treat a technical star differently, especially if he is negatively affecting the work of others. "A star could ac-

tually be costing you money by being territorial, especially if you start considering the percentage of salaries being wasted because of the star's adverse affect on other employees' productivity," Kennedy points out. "And when you realize that, the star begins to dim."

- Put reviews in a positive light. "When management treats reviews as the Day of Judgment, complete with thunder, suspense and black clouds, [employee] productivity tends to become very selective," Kennedy says. A doom-and-gloom attitude is bound to put added pressure on the conductor of the review as well as the subject.

Similarly, don't characterize reviews as the determining factor in whether employees are going to be kept on at a company. "Real performance appraisals should improve people's performance," Kennedy says, "not just allow them to keep their job from review to review."

- Don't think that you have to make your employees like you. "As unbelievable as it may seem," Kennedy says, "you don't have to like the person you're reviewing, and they don't have to like you." Keep in mind the impression that you want the employee to come away with. "The employee's post-review thought shouldn't be, 'Do I like my manager?' but 'Was the review useful to me or not?'"

- Make sure reviewing is an ongoing process. Provide short-term deadlines for the employee in terms of his continuing education and productivity goals, and then assist him in keeping track of his progress.

Focus on Opportunities With Profile of the Professional. Las Vegas. Feb. 8-11 — Contact: International Association for Computer Operations Management, 742 E. Chapman Ave., Orange, Calif. 92866.

Data Storage Interface Week. San Jose, Calif. Feb. 8-12 — Contact: Technology Forums, Suite 380, 90 W. 70th St., Chanhassen, Mass. 55317.

CA* 88 Conference and Exhibition on Backup and Workstation Publishing Systems. Washington, D.C., Feb. 9-11 — Contact: Computer Aided Publishing, Suite 350, 90 W. Montgomery Ave., Rockville, Md. 20850.

Usenix Technical Conference. Dallas, Feb. 9-12 — Contact: Usenix Conference Office, P.O. Box 385, 16951 Pacific Coast Highway, Sunset Beach, Calif. 90742.

Second Conference on Applied Natural Language Processing. Austin, Texas, Feb. 9-12 — Contact: Donald Walker, Bell Communications Research, MRE 2A379, 445 South St., Morristown, N.J. 07960.

Interex Computing Management Symposium. Anaheim, Calif., Feb. 10-13 — Contact: Interex Conference Department, 680 Almanor Ave., Sunnyvale, Calif. 94086.

FEB 14–18

11th Annual Internal Computing Forum. Naples, Fla., Feb. 21-24 — Contact: Joanne Rogers, Silverstein Holdings, 233 Park Ave., New York, N.Y. 10152.

The fifth Annual Electronic Printing Systems Conference. San Jose, Calif., Feb. 15-17 — Contact: S. Thomas Dunn, EPS '88 Conference Chairman, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

Effective Methods for Rate Forecasting Quality Assurance. Orlando, Fla., Feb. 15-19 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

Fourth Annual Computer Graphics New York. New York, Feb. 22-24 — Contact: David J. Small, Exhibition Marketing & Management Co., Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Vision Guidance for Robotic Systems. Cincinnati, Feb. 23-25 — Contact: Joanne Rogers, Silverstein, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Interactive Instruction Delivery/Learning Technology in the Health Care Sciences. Kissimee, Fla., Feb. 24-26 — Contact: Society for Applied Learning Technology, 50 Culpeper St., Warrenton, Va. 22186.

Strategic Planning for Your Telecommunications: The Role of the Planner in the 1990s. Atlanta, Feb. 26 — Contact: Ada Rivera, Executive Programs, 1221 Avenue of the Americas, New York, N.Y. 10020.

FEB 28–MARCH

Telecom '88 South Telecommunications Conference. Bal Harbour, Fla., Feb. 28-March 2 — Contact: American Business Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Third International Conference on CD ROM. Seattle, March 1-3 — Contact: Sherrie Eastman, Microsoft Corp., Box 97017, 16611 N.E. 36th Way, Redmond, Wash. 98073.

Expo Europa 88. London, March 1-3 — Contact: Exposconsult International, Inc., 2 Independence Way, Princeton, N.J. 08540.

MARCH 7–11

2nd IEEE Conference on Computer Workstations. Santa Clara, Calif., March 7-10 — Contact: Computer Society of the IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Federal Office Systems Expo (FOSE) '88. Washington, D.C., March 7-10 — Contact: Debbie Murray, National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

1988 Spring National Design Engineering Show and Conference. Chicago, March 7-10 — Contact: SPGES, 999 Summer St., Stamford, Conn. 06905.

Gibson

the business. Among IBM's moves to revitalize account control is an effort to assure that it is the primary maintenance provider at a shop. This is in accord with the belief that he who controls maintenance controls the hardware in a shop.

IBM's Corporate Service Amendment discount program and its recent deinstallation and reinstallation price reductions show that IBM wants this role. It wants to gain market share in maintenance rather than just earn more maintenance dollars.

In addition, IBM has acknowledged it is carrying out a pilot program in which it acts as a single point of contact for all data center maintenance, including maintenance done by non-IBM providers.

In addition, the creation of IBM's Application Systems Division in an attempt

W HILE one-stop shopping may be good at suburban shopping malls, is it good for the MIS shop?

to offer a single point of contact for applications software needs, whether or not it wrote the software, is sold to the customer. IBM uses the phrase "one-stop shopping."

While one-stop shopping may be good at suburban shopping malls, is it good for the MIS shop? On the one hand, it offers convenience and allows a buyer to spend less time shopping and more time on other things. A buyer can hope to benefit from Volume Procurement Amendment discounts as well. There will no doubt be some shops for which such an arrangement works best.

On the other hand, stopping at only one store is a lazy way to buy anything. When the stakes are as high as they are in computing — keeping costs down and giving a company a strategic competitive edge — lazy shopping habits are likely to be out of place.

Besides, MIS managers are paid to get the best deal possible for their company. They are paid to shop around, not just to fill out an order form.

IBM's efforts to offer everything under one roof can bring more choice, especially in the short run, providing the user does price and compare some of IBM's new offerings with others on the market. But users will have to actually buy a fair percentage of non-IBM gear in order to preserve choice and keep all vendors' prices competitive.

According to several customers, recent IBM hardware deals have been particularly attractive when competition has been involved. This proves the wisdom of getting competing bids and considering them seriously.

Keeping a variety of vendors around, despite any inconvenience, is an investment in the future. It provides leverage and ensures that when IBM offers a price on competing equipment, it will be a fair price. Some MIS managers know this and do this. This is how they control their accounts.

Gibson is a Computerworld senior writer.

NORTHEAST

Northport, N.Y., Jan. 12. Data Processing Management Association (DPMA), Suffolk County Chapter. Local Area Networks, with The Computer Station. Woodmoore Restaurant, Rt. 25A, 8 p.m. Contact: Moseka Mac Leso, Suffolk County DPMA, 257 Depot Road, Huntington Station, N.Y. 11743.

New York, Jan. 13. Association for Women in Computing (AWC) New York Chapter. Documentation for Hardware and Software panel discussion. Manufacturers Hanover Trust, 270 Park Ave. 5:30 p.m. Contact: AWC, P.O. Box 2293, Grand Central Station, New York, N.Y. 10163.

Harrisburg, Pa., Jan. 13. Association for Systems Management (ASM). Central Pennsylvania Chapter. Local Area Networks, with Thomas Slick of Tandem. Hoss's Restaurant, 5:30 p.m. Contact: Mark Anderson, 800 Ash Road, Mechanicsburg, Pa. 17055.

Boston, Mass., Jan. 18. Society for Management of Professional Computing. Digital Equipment Detractors in Distributed Computing. Anthony's Pier 4, 11:45 a.m. Contact: SMPC, 715 Boylston St., Boston, Mass. 02116.

Bangor, Maine, Jan. 20. Data Processing Management Association (DPMA), Maine Pine Tree Chapter. Leadership Qualities, with former Gov. Ken Curtis. The Bangor Hilton, 6 p.m. Contact: J. Pewegar, Delta Chemicals, Inc., Searsport, Maine 04974.

Boston, Jan. 21. Society for Information Management, Boston Chapter. What Can We Learn from European MIS? with John Thompson of Index Group. Anthony's Pier 4, 11:45 a.m. Contact: SIM, P.O. Box 116, Newton Lower Falls, Mass. 02162.

SOUTHEAST

Chamblee, Ga., Jan. 13. ASM, Atlanta Chapter. Data Planning Concepts, with Barbara Behrner of Data Architects. Holiday Inn Chamblee-Dunwoody, 4308 Chamblee-Dunwoody Road. 5:30 p.m. Contact: Jane Roberts, HBO & Co., Suite 1000, 1 Ravinia Drive, Atlanta, Ga. 30346.

Charlotte, N.C., Jan. 21. ASM, Queen City Chapter. Managing for the Future, with Robert E. Roberson of University of South Carolina. Crown Central Room, $100 E. Independence Blvd. 6 p.m. Contact: Robert Townsend, Morris Information Services, Suite 140, 7 Parkway Plaza, Charlotte, N.C. 28217.

Lafayette, La., Jan. 21. DPMA, Acadiana Chapter. Monthly meeting, Evangeline Steak House, Highway 167 S. 6:30 p.m. Contact: Delois Billeaud, Guaranty Bank and Trust Co., 4th Floor, 2000 W. Congress, Lafayette, La. 70580.

MIDWEST

Talon, Ohio, Jan. 6. ASM, Toluo Chapter. The Critical Role of Teamwork in Data Processing, with Roy Dickens. 5:00 p.m. Sherston Inn Airport, 2201 N. 77th East Ave. Contact: Nonnie Maxby, ASM, P.O. Box 2920, Talon, Ohio 74101.

Indianapolis, Jan. 7. ASM, Indiana Chapter. Strategic Data Base Planning — Enterprise Modeling, with Jeff Hodler of Indiana University. Holiday Inn Southwest, Intersate 465 and Emerson Ave. 6 p.m. Contact: Lloyd Lentz, ASM, Bank One Indiana, 450 E. Washington St., Indianapolis, Ind. 46277.

Des Moines, Iowa, Jan. 11. ASM, Des Moines Chapter. Amarican/Aggressive/Passive Communication, with Kay Prihoda of Seventh Systems. Howard Johnson Inn, Merle Hay Road, 5 p.m. Contact: Joleen Messog, Integrated Resources Life Insurance Co., 2737 Westown Pkwy., West Des Moines, Iowa 50265.

Sylvania, Ohio, Jan. 12. ASM, Toledo Chapter. Artificial Intelligence, with Richard Audi of AT&T. The Someplace Else. 5:30 p.m. Contact: Dale E. Briggs, Systems Division, Marathon Oil Co., 539 S. Main St., Findlay, Ohio 45840.

*From all of us at Comdisco,
have a warm and merry holiday season.*

COMDISCO

Kalamazoo, Mich., Jan. 13. DPMA, Southwestern Michigan Chapter. Monthly meeting. Contact: William J. Heaton, The Upjohn Co., 7171 Portage Road, Kalamazoo, Mich. 49001.

Fort Wayne, Ind., Jan. 19. ASM, Fort Wayne Chapter. Critical Success Factors for I/S, with Max Standard of Ernst & Whinney. Holiday Inn-Downtown. 300 E. Washington Blvd. Contact: Beth Rodoll, Suite 103, 10427 Lee Road, Fort Wayne, Ind. 46825.

Hinsdale, Ill., Jan. 19. ASM, Chicago and Chicago chapters. Computer Crime, with U.S. Attorney Anton Valukas, Cypress Restaurant, 500 E. Ogden Ave. 8 p.m. Contact: David P. Miller, 508 W. Glencoe Road, Palatine, Ill. 60067.

Dayton, Ohio, Jan. 22. DPMA, El Paso Chapter. Monthly meeting. Officers Club. Wright-Patterson Air Force Base. 5:30 p.m. Contact: S. Brothe-Owen, Western Ohio Print, Inc., 3324 Stanley Ave., Dayton, Ohio 45404.

Columbus, Ohio, Jan. 27. ASM, Central Ohio Chapter. Children's Hospital's Use of Computers, with Malcolm Murray of Children's Hospital, Systems Application Architecture, with Dick O'Connor of IBM. Fawcett Center for Tomorrow, 2400 Olentangy River Road, 5 p.m. Contact: Deborah Manzara, Columbus Southern Power Co., 215 N. Front St., Columbus, Ohio 43220.

El Paso, Texas, Jan. 22. DPMA, El Paso Chapter. Awards and new officer installation. Great American Land & Cattle. 5:30 p.m. Contact: Steve Tarro, P.O. Box FVW, Las Cruces, N.M. 88004.

San Francisco, Jan. 21. Association for Computing Machinery, Golden Gate Chapter. The Changing Role of Coprocessors, with Bruce Gerber. Seven Hills. 202 California. 5:30 p.m. Contact: James M. Spraa, The Systems Consulting Consortium, Inc., P.O. Box 2331, Stanford, Calif. 94305.

Walnut Creek, Calif., Jan. 20. ASM, East Bay Chapter. Monthly dinner meeting. Contact: ASM, 32 Robert Road, Orinda, Calif. 94563.

Santa Monica, Calif., Jan. 23. DPMA, Santa Monica Chapter. 1988 Installation Dinner Dance. The Chronicle Restaurant, 2640 Main St. 6 p.m. Contact: DPMA, P.O. Box 1047, Hollywood, Calif. 90078.

Ottawa, Ont., Jan. 13. ASM, Ottawa Valley Chapter. Microcomputer Financial Systems — Lessons of an Ottawa Project. Ottawa Board of Trade, 185 Sparks St. Contact: Arnold Finkelstein, Bank of Canada.

Kitchener, Ont., Jan. 18. ASM, Conestoga Chapter. I.S. Productivity, with Bruce Borgelt of Gelburn-Harward & Partners. Conestoga Inn. 8 p.m. Contact: Rick Chatterar, 49 Industrial Drive, Elmira, Ontario, Canada. N3B 3B1.

High-tech work not seen as burnout threat

WILLOW GROVE, Pa. — Burnout is common among business managers and appears to arise more frequently among women than men, according to a recent study conducted by the Administrative Management Society (AMS).

But working with computers does not pose a significant threat of burnout. In a list compiled from survey responses, the AMS found that of the most common sources of stress, working with computers is last, along with travel and working with budgets.

In a survey of 344 managers from companies of various sizes around the U.S., 57% said burnout is common among managers. Of those reporting burnout, 55% were women.

Just under two-thirds of the managers responding — 65% — said their jobs are more stressful than average.

China in DP worker pinch

Faces shortage of half-million computer specialists by 2000

HONG KONG — The People's Republic of China may face a shortfall of 500,000 computer specialists by the year 2000, according to a recent newsletter report.

Approximately one million people have undergone some sort of information technology training in China, but specialized skills are in short supply, according to Chinese experts quoted in "China Informatics," a newsletter published by management research firm International Data Corp. China Ltd.

China will need 720,000 information technology specialists by 1990, and 1.93 million by the end of the century, according to the report in the newsletter, which was formerly named "EDP China Report."

The shortfall is expected to total between 20,000 and 30,000 by 1990, growing to 500,000 by the end of the century.

State Council officials Guo Rungdun and Lu Jianzhong reported that while electronic data processing training in China began in the mid-1960s, most of today's users learned their craft during the country's sixth five-year plan, which ended in 1985.

After 1985, China was able to call upon some 32,000 people with specialized skills in disciplines such as data and telecommunications. By then, at least 812 organizations had begun to offer information technology training. But demand for fully trained staff is said to be outstripping supply.

The two officials said that China has tackled information technology education on four fronts — through correspondence courses, short-term full-time education, on-the-job training and retraining.

The changing nature of technology has

> **S**OURCES SAID part of the shortfall could be blamed on the repression of so-called intellectuals during the 1960s. One referred to the period as a "generation of lost skills."

added to China's problem, but a partial solution has been found in continuing education through the country's Television University. Television University functions similarly to the UK's Open University, which offers broadcast lectures and correspondence courses to full-time workers.

China's sixth five-year plan provided 100,000 people with some form of information technology training through Television University.

Between 15,000 and 20,000 Chinese engineers also attended information technology courses lasting from three to six months at educational institutions in China during the same period.

Courses organized by work units were attended by 36,000 people — roughly 1.75% of the working population in China during that period. At Beijing's Capital Iron and Steel Co., 10% of the work force was given information technology training, the report said.

Retraining poses the biggest problem for China. A large group of older technicians, many of whom were USSR-trained, have skills that are increasingly out of date, and many of them need foreign language training, according to the officials.

Though no comment was made on the depredations of China's cultural revolution, other sources said that part of the shortfall could be blamed on the repression of so-called intellectuals during the 1960s. One referred to the period as a "generation of lost skills."

With the recent shift in politics in China, more students are emerging with information technology skills. About 60% of China's universities, colleges and vocational training schools offer information technology-related studies.

At the junior-school level, however, the country is able to do very little. The number of primary schools is so large that equipping them adequately remains impossible.

Europe's auditors key into security

AMSTERDAM — Security issues, including the need for coordinated European action, stole the limelight at a conference here last month attended by nearly 500 data processing auditors.

John A. Mitza, president of the Electronic Data Processing Auditors Association (EDPAA), said one of the main tasks of an EDP auditor is to advise management about problems such as the security of internal data flow.

The gathering — the Second European Conference on Computer Audit, Control and Security — was organized by the EDPAA and the Dutch computer association, NGI.

In his closing speech, Louis Bril, Belgium's secretary of state for science policy and public service, called for common data security measures among European governments.

It is important to develop "common approaches for penal law and for procedural law in order to protect international data networks, to enable the functioning of international instruments of cooperation in criminal matters and to guarantee that evidence gathered in one country is admissible in court in another country," Bril said.

"What is needed is not a mechanistic reaction to the requirements of some law, but rather a full appreciation of the role of and need for data protection in an organized working environment," Bril said. Mitza, EDP auditor at Liberty National Bank & Trust Co. of Louisville in Kentucky, said auditors face a challenge in keeping abreast of technological change.

COMPUTER INDUSTRY

INDUSTRY INSIGHT

James A. Martin

Taiwan first on the block?

Speculation is growing that the first steps into the uncertain waters of the soon-to-materialize IBM Personal System/2-compatible industry will be taken by Taiwanese companies, not American ones.

At Comdex/Fall '87, for example, Mitac International reportedly previewed a PS/2 Model 30 clone. The machine is supposed to be available early next year for less than $1,000, compared with IBM's $1,695 list price for the Model 30. The Mitac version is said to be based on a chip set from Chips and Technologies and a BIOS system from Phoenix Technologies.

In addition, unconfirmed reports strongly suggest that Multitech Electronics is Taiwan — and, possibly, its San Jose, Calif., affiliate, Acer Technology — is preparing to introduce a Model 30 compatible this spring and, perhaps, a PS/2 Model 50 Micro Channel clone as well.

Although Multitech has downplayed the reports, just about everyone is saying that a Model 50 look-alike is possible in time for Comdex/Spring '88 and that Multitech, or perhaps another aggressive offshore company, will be the one to introduce it.

Ripe for the picking
While compatible vendors in the U.S. struggle with cold feet, there's a brand new market ripe for the picking, and many Asian companies are just brazen enough to take the chance. After all, they have the most to gain and the least to lose.

Asian micro vendors had their first opportunity for the American market when Chips and Technologies started making low-cost Personal Computer AT chip sets. But the PC AT-compatible market soon became flooded with more "metoo" products than anyone would care to count.

This time around, however, the situation is quite different. There is a potentially lucrative PS/2-compatible industry just
Continued on page 114

Memorex bids to buy out Telex

Company welcomes 'white knight' offer after Edelman's hostile attempts

BY CLINTON WILDER
CW STAFF

TULSA, Okla. — Taking the first step toward a major consolidation in the IBM-compatible terminals industry, Memorex International N.V. last week launched a friendly acquisition bid for hostile takeover target Telex Corp.

Telex, which has been trying for weeks to fend off corporate raider Asher B. Edelman, welcomed the Memorex bid, which is roughly $7 per share higher than Edelman's recently lowered offer. But Edelman intends to continue his effort and said in a strongly worded letter to Telex that he may consider raising his bid.

The offer from London-based Memorex amounts to an estimated $911.4 million in cash and stock, compared with Edelman's

cash offer of $808.5 million.

Edelman, with a higher bid from Edelman, the fact that Telex management welcomes the "white knight" offer gives Memorex a good chance to succeed in the acquisition, analysts said.

Makes sense
"Assuming Memorex can raise the money, the thing makes a lot of sense strategically," said Michael Geran of E. F. Hutton & Co. "There are natural economies of scale here, and Memorex is stronger overseas, while Telex has strength in the U.S."

If Memorex is successful, the merger will dramatically increase its share of the IBM 3270 terminal market, in which Telex trails only IBM itself (see chart below). Ironically, Memorex was rumored to be considering withdrawal from that business before Unisys Corp. sold most of Me-

morex to Memorex's international management group last year [CW, Nov. 10, 1986].

Enlarge IBM business
A merger would also combine the two firms' IBM System/36 and 38 terminals businesses, a market Telex entered in late 1986. In 1986, Memorex was third in U.S. shipments of those terminals with 5% of the market, according to Framingham, Mass.-based market research firm International Data Corp. (IDC). IBM controlled 73% of the market, and Decision Industries Corp., another current hostile takeover target (see story below), held 17%.

"The whole synergy would be very good for Telex in that market," IDC senior analyst Eileen O'Brien said. "The 3270 market
Continued on page 107

The urge to merge
1986 IBM 3270 terminal U.S. market share

PERCENT MARKET SHARE

IBM	
Memorex	5.2%
Other	8.5%
Lee Data	4.5%
Copier Information Systems	
AT&T	

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Onset raises ante in bid

BY ALAN ALPER
CW STAFF

NEW YORK — Onset Corp., the shell company formed by venture capitalists to acquire Decision Industries Corp., last week raised its friendly tender offer above a competing hostile bid from Econocom International N.V.

Onset increased its offer by
Continued on page 107

Supplier woes hit Micropro

Documentation delay causes late shipments

BY STEPHEN JONES
CW STAFF

SAN RAFAEL, Calif. — Delays in product shipments have sidetracked Micropro International Corp.'s bid to regain some of its lost glory as the former king of word processing software, the company said last week.

Micropro said that shipments of its Wordstar 2000 Release 3 were delayed because the vendor received late delivery of documentation and other printed materials from its supplier, Chicago-based R. R. Donnelley & Sons Co.

Without the printed materials and packaging for Wordstar 2000, Micropro was left with disks that could not be delivered, said Leon Williams, president and chief executive officer of Micropro.

Officials at R. R. Donnelley would not comment on the late shipments.

Sales figures hurt
Although the Wordstar 2000 copies have since shipped, Williams said that about $700,000 will be conspicuously absent
Continued on page 106

Inside
- Western Digital acquires Tandon's Winchester business. Page 106.
- Texas Instruments chairman retires. Page 106.

ADR's Bennett heads for greener pastures

BY ALAN ALPER
CW STAFF

PRINCETON, N.J. — There comes a time when all top executives contemplate the greener pastures of retirement. For John Bennett, who at the end of this month will cap a 21-year career with Applied Data Research, Inc. (ADR), retirement means sampling the putting greens of the world's greatest golf courses.

"At my age, it will be a challenge to play hard, maybe golf at 12," quote the spunky 65-year-old ADR chairman. "In all candor, though, I'll probably get it down to 10, but that's based on who I play with."

While golf will take precedence over most matters, Bennett intends to stay close to ADR, the $170 million mainframe data base management systems developer and subsidiary of Ameritech. Under an open-end consulting contract, he will make occasional sales calls to key accounts and presentations at conferences and seminars, while splitting time between his homes in Stuart, Fla., and Skillman, N.J.

In preparation for his departure, Bennett passed the chief executive's baton in September to President Dennis Strigl, who joined ADR a year earlier from a sister Ameritech company. Although Ameritech policy calls for executives to retire at 65, Bennett says he was not asked to step aside.

John Bennett

"I have an easement desire to enjoy the rest of my life," he says. "Retirement looks just fine to me."

Bennett, who spent 17 years as ADR's chief executive, is departing two years after negotiat-

ing its $215 million acquisition by Ameritech. The acquisition, which came after a six-month period of receding revenue growth and declining profitability, followed a 10-year span of revenue increases that averaged 30% annually for ADR.

"[John] knew when to exercise power, and he knew when to give it up," says Bernard Goldstein, a partner with software industry investment banking firm Broadview Associates in Fort Lee, N.J. "It's something that is not easy for a CEO."

During 1985 and 1986, growth at ADR and other DBMS vendors was stunted by the spreading influence of IBM's new relational DBMS, DB2. The
Continued on page 114

Western Digital purchases Tandon Winchester drive unit

CHATSWORTH, Calif. — Tandon Corp., the world's second-largest independent hard disk drive maker, last week announced the sale of its Winchester disk drive business to Western Digital Corp. for between $40 million and $45 million in cash.

In addition to the sale price, Irvine, Calif.-based Western Digital will absorb about $35 million in debts associated with the business, according to James Porter, president of Disk/Trend, a Mountain View, Calif., research and consulting firm.

Twelve-year-old Tandon will focus its efforts on the IBM-compatible microcomputer business that it entered in 1986.

Trails only Miniscribe

Tandon trails only Miniscribe Corp. in the independent 20M-byte, 3½-in. hard disk drive business, according to Porter.

"Western Digital has been looking for ways to get into disk drives for a number of years,"

Porter said.

"This certainly gives them a jump start in a very high-growth area. As for Tandon, they will have to make it in systems or not at all," he added.

TI Chairman Shepherd steps down

DALLAS — Texas Instruments, Inc. Chairman Mark Shepherd Jr. has announced his retirement and will pass his title to President and Chief Executive Officer Jerry R. Junkins.

Shepherd, 64, will leave TI on April 21 after 39 years with the company. Elected chairman in

1976, Shepherd will remain on the board of directors.

Shepherd joined the company in 1948 as a project engineer. He later became TI's chief semiconductor designer and was named general manager of the Semiconductor Components Division in 1954. He became a vice-presi-

dent the following year.

Shepherd became a TI executive vice-president and chief operating officer in 1961. He was named president in 1967, CEO in 1969 and chairman in 1976. He relinquished the roles of president and CEO to Junkins in 1985.

Micropro

from Micropro's first quarter sales totals because of the delays. The company's first fiscal quarter ended Nov. 30.

That leaves Micropro hoping that it can at least break even on its earnings, which are expected to be released by the end of this week.

For the same quarter last year, Micropro reported revenue of $8.4 million and barely broke even, with earnings of $26,000, yielding no per-share earnings.

Micropro has been slowly climbing out of the red during the last year, updating old programs to win back its vast installed base while among new products at specific vertical markets.

Road to recovery

Williams conceded that the shipment problems could check Micropro's apparent rebound, but he claimed the company is still on the road to recovery.

"In reality, the delays had nothing to do with the basic financial health of the company. It was a delivery problem, not a financial one," Williams explained.

Micropro said it has sold as many as 25,000 copies of Wordstar 2000 Release 3 since it was launched in late October.

The word processing package is available in two versions, one tailored to the legal community and the other designed for general-business use.

It's one thing to fill a document with data, another to fill it with content that makes someone take action. The document that best persuades not only has a typeset appearance, but visual as well as typographic elements, but also has superior content—facts and figures drawn from all possible sources to make a point of view, a point of sale.

This is what Xerox Document Systems are all about. Whether mainframe resident software, networked publishing systems, or stand-alone systems and software, Xerox Document Systems let you, the user, combine information from desktop and beyond to produce documents with superior quality and impact.

Take for instance, the Documenter, pictured below.

Consisting of the Xerox 6085 Professional Computer System, the Xerox 4045 Laser CP printer and Xerox ViewPoint software, the Documenter can do an entire job from start to finish—creating, editing, assembling, formatting text and graphics, and printing—in one seamless operation.

But the Documenter is not merely another desktop publishing system. Its networking capability allows it to access information both external and internal. With the Documenter's multitasking power linked to your organization's data base, or

Xerox Document Systems create proposals that will be tossed around

Onset

75 cents per share to $9.50 a share. J. H. Whitney & Co. and Welsh, Carson, Anderson & Stowe, the New York investment firms that are behind Onset, declined to say why they upped the offer for all 9.4 million of Decision Industries' outstanding shares.

"One can draw his own conclusion," said William Hewitt, an attorney representing the investment group. Onset's offer expires Dec. 29.

Onset increased its offer Tuesday, two days before a competing $8.75 offer made by Econocom was to expire. The timing was important, some said, since most shareholders tender their shares just prior to an offer's expiration date. The sweetened offer was expected to give shareholders, mainly institutions, an incentive to tender their shares to Onset rather than take Econocom's offer.

Econocom had said it would be willing to increase its $8.75 offer if financial information provided by Decision Industries merited such action. A spokes-

woman for the Amsterdam-based international leasing firm declined comment at press time. Econocom owns approximately 23% of Decision Industries' outstanding shares.

As part of the amended offer, fees payable to Onset would be increased by $2 million to $5.5 million in the event the deal to acquire Decision Industries is not concluded and another con-

cern, such as Econocom, purchases the Horsham, Pa., firm. "This protects [Onset's] interest and compensates them as the 'White Knight' who helped raise the price paid to shareholders," explained Joel Sussman, Decision Industries' treasurer.

Decision Industries' board has recommended that shareholders accept Onset's offer. The offer is contingent on receiving a majority of Decision Industries' shares and Onset's ability to obtain a three-year, $50 million revolving credit line.

Memorex

is an extremely mature one for terminals, and Telex needed to get into other areas, but they're definitely having problems in the System/3X market at this point.'"

Approximately 74% of Telex's outstanding shares had been tendered to TLX Acquisition Corp., the corporate entity formed by Edelman to mount the takeover, as of Nov. 24. But Telex stockholders can withdraw those shares and tender them to Memorex.

Edelman's demands

Late last week, Telex agreed to provide Edelman with the financial information that has been made available to Memorex.

Edelman also demanded in a letter to the company's board of directors that Telex "advise us of any other steps you have taken or expect to take to facilitate the Memorex proposal, so that we have a basis upon which to consider improving upon our offer.'"

Last month, Edelman lowered his bid by $10 per share to $55 [CW, Dec. 7]. The Memorex proposal offers shareholders $56 per share in cash and $6 per share in the junior preferred class of Memorex stock.

A Memorex-Telex combination would be a logical evolution within the terminals industry, which has been battered by price cuts and falling demand since the proliferation of personal computers.

"Even without Edelman, there would have been consolidation in this business anyway," Hutton's Geran said. "The profit got squeezed out of it."

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SPOTLIGHT

▼ ADD-IN BOARDS

The proliferation of board functions for PCs is merely
the prelude to an eruption of products for the next generation,
which promises to dramatically alter the landscape.

INSIDE

Adjusting the Focus

IBM's introduction of the PS/2 with its VGA standard is forcing manufacturers of add-in graphics boards to reevaluate strategies. Page S6.

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Joanne Kelleher

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RESEARCHER
Sally Cusack

ASSISTANT RESEARCHER
Bonnie MacKell

Cover illustration:
Paul Schulenburg

Some people are staving off the future with add-in boards that make the most of what they already own

USERS GUARD THEIR OPTIONS

BY MICHAEL SULLIVAN-TRAINOR

TED PITTS

Aerospace contractor Sundstrand Aviation is purchasing compatibles for the first time, ending six years of loyalty to IBM, because the add-in boards the company needs are not yet available for the Personal System/2. "Ever since the first personal computer, we were determined to go IBM all the way," says Jim Wilt, office systems analyst for the Rockford, Ill.-based division of Sundstrand Corp. "But we put the PS/2 on hold because we're not ready for it and the expansion boards aren't there."

The availability of add-in boards has always been an important factor in buying decisions. But the current explosion of new types of boards for existing machines — ranging from Intel Corp. 80386-based accelerators to local-area network connections — is making them an even more vital part of PC purchases, especially in view of market uncertainty about the flood of board products expected for the PS/2.

Although custom chips on IBM's PS/2 are performing some traditional board functions, users will require another generation of add-in boards to take full advantage of new bus architectures and future versions of IBM's and Microsoft Corp.'s OS/2 operating system.

But microcomputer managers are reacting cautiously to the developing onslaught of boards and functions that could dramatically change the nature of their PCs. For most, the issues of compatibility with installed systems and the level of end-user sophistication are more important than acquiring the latest technology.

"Many of the systems that are out don't have software applications designed to use the functionality they provide," says Jocelyn Young, a market analyst for Future Computing, Inc. in Dallas. "If you can get something to lengthen the lifespan of your existing product until there are

applications for the new system, that may be the wisest choice."

Micro managers' interest in enhancing old products while moving very slowly toward new ones is reflected in market predictions for add-in board purchases. The need for microcomputer, accelerator and memory boards will continue to drive add-in board sales through this year and the next. Future Computing predicts that one million more boards (ones not bundled in the original system) will be sold in 1988 than in '87.

After 1988, board demand will be limited until software applications can exploit coprocessor boards become available for the new bus architectures. In addition, because many IBM Personal Computer users will move to the PS/2, the functions provided by traditional multifunction boards will no longer be needed. Future Computing forecasts a decline in board purchases: Only 7.1 million boards will be bought in 1989; 7.2 million in 1990.

These trends are evident in the current plans of corporate users. At the Farm Bureau Insurance Group in Lansing, Mich., end users primarily employ traditional word processing and spreadsheet applications on nearly 200 assorted IBM PCs, PC XTs and ATs. Multifunction boards provide additional memory, ports, clocks and calendars for the systems, and IBM 3270 terminal emulation boards provide access to the

Sullivan-Trainor is a senior writer for Computerworld.

Options

company's host systems.

The Farm Bureau is installing add-in board acquisitions to create a standard set of easily maintained products, according to data center director Art Kelley. This careful board acquisition policy extends to 40 PS/2 Model 30s and two Model 50s that the company recently acquired.

Because the new systems include functions previously provided by multifunction boards, those boards are no longer necessary. The insurance group will install only emulation boards on the PS/2s. "We didn't have to re-evaluate our board set for the Model 30s," Kelley says. "We view them as enhanced replacements for the PCs and XTs. They're a little faster, but we don't have any illusions that they will run OS/2."

With the exception of a small percentage of power users who will use the Model 50s, the company says it does not foresee an immediate need for OS/2 or the advanced boards that will drive OS/2 applications.

E. F. Hutton & Co. in New York is taking a similarly conservative stance on board acquisitions. With 10,000 NCR Corp. 3390 AT-compatible workstations slated for installation in mid-1988, the firm is settling on a standard set of boards to meet application needs. New board developments are not part of E. F. Hutton's immediate future.

"Each time there is new technology, you look at it. But the bottom line is that what we have is working well within the constraints," says Mikan Milamed, vice-president of distributed systems.

Boards that are a priority in E. F. Hutton's plans are Starlan boards from Data General Corp. that connect PCs to a network of larger DG systems, memory boards used to enhance the capabilities of 800 NCR 810 workstations that receive stock market prices via satellite and synchronous communications boards from IBM.

Fast boards, slow systems

While IBM claims to have shipped more than one million PS/2s, the size of the installed base of its previous generation of PCs and compatibles far exceeds the number of new systems. Board suppliers are aiming a host of products at upgrading and enhancing an estimated 16 million IBM PCs and compatibles, according to Don Williams, senior vice-president of the Enhancement Products Group at AST Research, Inc. in Irvine, Calif.

OS/2 is one of the prime factors driving the need to upgrade existing systems. For example, an XT or compatible system can run OS/2 with the addition of an Intel 80286-based add-in board

and memory enhancements, Williams says.

"Large numbers of people will run OS/2 on other hardware platforms — either new machines or upgraded existing machines," says Jonathan Yarmos, a research analyst at the Gartner Group, Inc. in Stamford, Conn.

Users can choose from several ways to boost current PCs or XTs to 286-based machines. One method is to add a coprocessor board that can access its own 80286 memory but not directly

Unit sales of add-in boards
Projected number of boards sold separate from personal computers, 1987 to 1991*

	5.9	6.9	7.1	7.3	7.2	
	'87	'88	'89	'90	'91	'92

MILLIONS OF UNITS SOLD
* Excludes modem and hard-disk cards
INFORMATION PROVIDED BY FUTURE COMPUTING, INC.
CW CHART

access I/O devices on the motherboard. The system's original, slower Intel 8088 processor needs to intervene for all I/O operations.

Give and take

While coprocessors increase the speed of the original system, they also present drawbacks. For example, all of the 80286 board's memory must come with the board, thus increasing the cost. High-resolution graphics are also difficult. Full IBM Enhanced Graphics Adapter (EGA) or Video Graphics Array (VGA) emulation is hard to obtain at an acceptable speed.

Another alternative is to replace the system's original processor with an accelerator 80286 board. The replacement processor is attached via a cable to the socket from which the 8088 has been removed. This method gives the 80286 access to the most recent data through a cache memory, and the processor can emulate an 8088 to request data over the original bus.

These two methods are used to upgrade an 80286-based XT with an 80386 accelerator. The same problems that trouble the coprocessor approach for the 80286 hold true for that approach with the 80386. But use of a coprocessor avoids the necessity of removing the original AT 80286 processor.

Some vendors offer alternatives to these approaches. For example, AOX, Inc. in Waltham, Mass., provides a bus master approach to accelerator boards that resembles the concept behind the new bus architectures, such as the PS/2's Micro Channel. AOX's approach allows add-

in boards to temporarily take control of the bus by combining a cache design with a coprocessor.

Frequently, accelerators are also used for specialized applications.

Sanders Associates, Inc., a Nashua, N.H.-based military defense contractor, uses AI Architects, Inc.'s Hummingboard (an 80386 accelerator) to design interactive video-based training systems. Sanders accomplishes development work on PCs — XTs and ATs or compatibles — running Microsoft's MS-DOS. In addition to accelerators, the company uses digitizing boards to encode hint art and disk controller boards for added storage capability.

Sanders is unlikely to buy the newest PC systems, says Ralph Baer, an Engineering Fellow at Sanders, because the combination of old PCs and boards works well.

"We have all sorts of things clicking together. Why on earth would we want to change to a brand-new system?" Baer asks. "You can always do things faster and more efficiently, but you can't change every other year."

Effectively using 80386 accelerators with current DOS programs requires software extensions that allow 32-bit processing, says Tom Spaulding, president of AI Architects in Cambridge, Mass.

"The same program that runs in 16 bits on a 386 is 2½ times faster in 32 bits," he says.

Users are installing the company's Hummingboard with DOS extensions for computer-aided design (CAD) and artificial intelligence applications. The same CAD applications that run on Digital Equipment Corp. VAX minicomputers and Sun Microsystems, Inc. workstations can now run on a boosted PC, Spaulding claims.

Facing trade-offs

Nevertheless, users running more mundane applications are faced with trade-offs when considering accelerators. Purchasing an accelerator board for currently installed PCs, XTs, ATs or compatibles can save the cost of acquiring an 80286 or 80386 system. But economics is not the only factor involved in such decisions.

"With accelerators, the choice involves economics, the hassle factor and politics," says Julian Horwich, executive director of the Chicago Association for Microcomputing Professionals (CAMP).

Politically, buying an accelerator is often an expedient way to avoid a conflict with management. New software applications may become available within a

year of purchasing a new system. But the applications can run at optimum efficiency only on a more advanced machine with a faster processor — and managers tend to be reluctant to authorize brand-new system purchases within such a short time frame. Luckily, applications can be run with the help of a less expensive accelerator board.

Potential for conflict

The trouble is that adding a new board of any kind to an installed complex of hardware and software applications may cause other problems. "The biggest hassle with any of the boards is that you can get into a conflict with another board or device," Horwich says.

For example, Horwich says when he recently installed a memory board in one of his company's systems, a conflict occurred between the new board and a previously installed LAN board.

"The LAN board refused to work. We had to call one of the vendors and find out how to tell the software for the expanded memory board to access someplace else in memory to avoid conflict with the LAN," he says.

Theoretically, such conflicts can be avoided if all the boards are obtained from a single vendor that guarantees that all the

Residence pattern
Average number of projected add-in boards per personal computer, 1987 to 1991*

1.8	1.5	1.4	1.5	1.4	1.3	
'87	'88	'89	'90	'91	'92

NUMBER OF BOARDS
* Excludes modem and hard-disk cards
INFORMATION PROVIDED BY FUTURE COMPUTING, INC.
CW CHART

products work together. But this scenario is rarely possible because no single vendor supplies all the boards that users require. Usually, one vendor supplies accelerator and memory boards while another offers communications products.

As a result, managers charged with acquiring PC components tend to stick with a few vendors — ones whose products they have worked with through the years — to avoid potential conflicts.

"Once, you used to buy one machine and one set of support products all from the same vendor," Horwich says. "Today, there is more than one kind of personal computer out there. There are four or five types of boards from different vendors in each system and 10 types of software from different vendors.

One of the major challenges of the personal computer is accomplishing all the integration."

Evolving to new standards

User interest in accelerators and in upgrading their current systems is expected to last only as long as users are willing to make do with old machines.

"We are presently on a market edge, like the time we move from the PC to the AT," says Martin Alpert, president of Cordata Corp., a Cleveland-based PS/2 board vendor. "Whenever there is a market edge, transient opportunities occur. One of those opportunities is accelerator processor boards. But as the price of 386-based machines comes down, the market will move from alternate processor to current machines to new machines."

Alpert pegs the life cycle of the "transient opportunity" for alternate processor boards at a year and a half.

Traditional multifunction, basic graphics emulation and accelerator boards are expected to become less popular as users install more PS/2s and machines with PS/2-like functions.

Memory and communications products, however, will be in much in demand for the new systems as they are for the old.

Currently, the average personal computer boasts a memory of a megabyte or less, according to the Gartner Group's Yarmos. OS/2 will require about 3M bytes or more, he adds. Local-area networking, already a significant part of users' board requirements, will also increase as more users connect from the next generation of PCs.

"I would never proclaim any year as 'The Year of the LAN,' but we will finally see some increase in LAN software functionality," Yarmos says. "OS/2's communications ability will — if not bring about more boards — certainly cause people to buy the ones out there already."

Board requirements are changing because of new bus architectures and the software to drive them. Whereas once there were two primary bus architectures offered by the leading microcomputer vendors — IBM and Apple Computer, Inc. — today, there are five and possibly more on the way.

Although IBM stopped making PCs and XTs — and the days of the AT are numbered — the IBM's original bus continued to thrive on machines made by vendors of compatibles.

The Apple Macintosh did not offer an open architecture for board vendors' products until

this year's introduction of the Macintosh II.

"The Mac SE and Mac II are really open systems now, and there is an opportunity for board vendors that didn't [previously] exist," Yarmus says. "With an increased acceptance of Apple in corporations, this is a viable add-in market."

Macintosh boards that allow links with other personal computers, host connections, added memory and enhanced displays are all becoming available to Mac users.

However, some vendors are reluctant to enter the Macintosh market because of the trade-offs involved.

"It is a rapidly growing market, and there are few barriers," says Robert Brown, president of Quadram in Norcross, Ga. "But it is another segmentation of the board business, and Apple's policy is that they are going to own the popular enhancements and peripherals for their products. You have to be careful which products you choose, or you might get stepped on by Apple."

Alternatives available

Despite IBM's traditional domination of the corporate market, other vendors are joining Apple in offering alternative architectures on new personal computers.

This year, compatible maker Compaq Computer Corp. introduced the Deskpro 386/20 with a 32-bit memory bus based on the firm's Flexible Advanced Systems (Flex) architecture. The system separates the memory and peripheral buses, allowing 32-bit access to memory. It also includes a cache memory system.

AST Research also announced a sophisticated bus this year. This action represents part of its first move away from exclusively selling boards to offering personal computers as well. The Smartslot architecture is available on the vendor's Premium/386 system. Like Compaq's Flex, AST's bus provides separate memory and peripheral access. Smartslot also includes an "arbitration circuit" that facilitates the use of intelligent coprocessors.

Both the Compaq and AST architectures claim AT compatibility, distinguishing them from IBM's Micro Channel architecture, which does not allow compatibility between the PS/2 and AT.

Users not ready to buy into IBM's PS/2 strategy because of compatibility issues welcome the alternatives provided by other vendors. For example, Sundstrand recently bought about 40 AST Premium/386s.

"We're buying the AST's

rather than PS/2s because of the availability of the boards and the cost savings," Sundstrand's Wilt says.

For companies replacing their current systems with PS/2s, the Micro Channel architecture means less boards in the short term and, in the long term, the ability to take advantage of new board functions.

Travelers Insurance Co. in Hartford, Conn., is switching to a personal computer standard based on the PS/2 Model 60. The company acquired about 500 systems this year to replace its PC ATs.

"Every AT had an EGA board and a memory board with 128K bytes installed. That made them EGA-capable. 640K-byte machines," says Lee Nolan, project manager at Travelers. "These functions are both taken care of on the PS/2. You have 1M byte of memory and a VGA all built in. That certainly decreased our board business."

Because of plans to run OS/2 Extended Edition when it becomes available, Travelers is acquiring 2M-byte memory boards for many of its PS/2s and memory ATs. For communications, the company uses Digital Communications Associates, Inc.'s Irma 3270 micro-to-mainframe and IBM Token-Ring LAN boards.

In going with the PS/2, Travelers says it was more interested in the system's potential than it was concerned about incompatibility.

Switching from the AT to the

unworkable on the faster ATs.

"Everyone had to redesign their memory adapters. Did you hear anyone screaming there?" Nolan asks. "This change only appears to be different because it forces you to go back and redo the hardware."

A welling next generation

New architectures like IBM's Micro Channel will provide platforms for the next generation of

add-in boards.

"The new Mac II bus and the Micro Channel are both multimaster buses. You can plug in multiple processors, and any processor can take control of the bus," AI Architects' Spaulding says.

On AT-type systems, the CPU is the only master of the bus, and other boards are not allowed to take control. This means that throughput is allowed to the speed of the AT.

"We can put up to four Hummingboards into an AT, but because of the limited bandwidth, the throughput is quite slow. You can't really do parallel processing in which you share tasks among processors," Spaulding says.

Multiprocessor boards with bus master capability should be available by the end of 1988 or '89, Spaulding predicts.

Board suppliers are now working on multiprocessors to enhance networking, graphics and multiuser applications. One function is to increase system throughput by transferring control between the PS/2 CPU and add-in boards armed with their own specialized processors.

"On a given processor, you could have a certain number of workstations attached in a lockstep network," says Jim McClellan, IBM's manager of strategic and systems planning for the Personal System line. "After you get past a certain number of workstations, the throughput is so degraded you can't add any

more users. With the Micro Channel and bus master boards, the throughput is improved to the degree that users get better response and more workstations can be added."

While multiple processors working concurrently may pave the way for more sophisticated applications, the boards will not be popular with users until there are software drivers to go with them. For this reason, board de-

velopers are working with software vendors to develop applications in this area.

"The software implications of concurrent processors are a little troubling," says Ken Bosomworth, president of International Resource Development, Inc., a Norwalk, Conn., market research firm. "While parallel hardware folks can see how to build such things, getting software to take advantage of them is quite difficult. You end up with a coprocessor and the memory and the main processor needing to continually wait on each other."

Users are equally unimpressed with the short-term implications of multiprocessors, but, in the long run, they see productivity improvements.

"Today, the PS/2 is a problem because of the new types of boards you have to buy," CAMP's Horwich says. "In the long term, the Micro Channel has more value because of the new genres of boards — I/O processors, better graphics processors. It is a much nicer platform to develop on than the classic bus, and the third-party suppliers will respond."

Scholarly caution

At Loyola University of Chicago, users work with a variety of personal computers, including IBM PCs, XTs, ATs and compatibles and a few 386-based machines.

Each year, the university also bibles its supercomputer population; it jumped from about 600 or 700 last year to 1,300 this year. As the school adds new types of systems, more sophisticated boards are required.

"Most of the boards for the compatibles are now performing connectivity functions, whereas

in the past, boards were used to beef up the workstation itself," says Don Wee, information center analyst at Loyola.

Despite user interest in new personal computers, such as the PS/2, Loyola's information systems department is taking a cautious approach to acquiring the new systems until applications are developed.

"My hope is that the design of the bus to allow cooperative processing will open up all sorts of new things we haven't even dreamed of yet," Wee says.

Even at Sundstrand, where AST compatibles are being installed as an interim solution, users hope that new developments will make the architectures more attractive.

"If boards come out to do some of the things that take time now — like screen updates and high-resolution graphics — we'll be immediately interested in them," Wilt says. "As soon as users say they need three processors on one machine to run a certain function, we'll reevaluate our AST standard."

Where's the support?

In the meantime, Wilt and other managers are concerned about more basic problems. "No matter which third-party manufacturer it is, if you call them with a support problem that requires more than basic information, they won't be able to help you," he says.

The standard response from vendor support personnel is to tell users to check whether the board is installed properly, Wilt adds. For more sophisticated users, the issue is usually a problem of conflict rather than something simple.

"I find it very discouraging having to train the support person when I'm calling for help," Wilt says.

In many cases, vendors are responding to such complaints with stepped-up programs.

"Vendors are ramping up on service and support because they realize how important it is to maintain existing customer loyalty and to make sales to more sophisticated users," Future Computing's Young says.

"Business declined substantially after the April 2 announcement [of the PS/2]," says Daniel Klein, an Atlanta-based distributor of add-in boards to Fortune 500 companies. "Corporate users needed time to digest what IBM introduced, and most people put a freeze on buying new systems until they evaluated the PS/2."

Now, users are coming to the end of their evaluations, and board makers are gearing their development toward the future.

"I'm hoping I'll be pleasantly surprised by what develops. Loyola's Wee says. "Right now, though, I'm not expecting anything to knock my socks off in the coming year." •

> THE MICRO Channel has more value because of the new genres of boards. It is a nicer platform to develop on than the classic bus, and third-party suppliers will respond.
>
> JULIAN HORWICH
> CHICAGO ASSOCIATION FOR
> MICROCOMPUTING PROFESSIONALS

PS/2 provides users with a higher processor speed, a larger board disk and higher throughput potential, Nolan says.

"The machine setup is easier from the hardware viewpoint, because there are no switches to set or jumpers to change. There are much better graphics, a better monitor and higher resolution. What more could you want?" he asks.

Nolan says the transition to the PS/2 is a lot less traumatic than is often portrayed. "There was a fair amount of change from the PC's 8-bit bus to the AT's 16-bit bus," he says. "But everybody just kind of ignored it."

At that time, suppliers of I/O boards did not change their products to accommodate the new bus, but the memory board makers had to switch from 8 to 16 bits because the PC boards were

A welling next generation

Shrinkage in board peripherals segment
U.S. unit sales are projected to decline as a percent of all peripherals sales between 1987 and 1992

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Shift seen for graphics boards

BY SUSAN MESSENHEIMER

The market for add-on graphics boards has exploded in the last several years, fueling the efforts of some 100 vendors.

But now the Personal System/2 offers integral graphics — the Video Graphics Array (VGA) standard — which offers a basic 16 colors at 640- by 480-pixel resolution and an optional 256 colors at a 320- by 200-pixel resolution.

VGA has altered the outlook for the graphics board industry. At minimum, VGA portends a gradual erosion of the market and the certainty of a shakeout for vendors at the low end.

Board makers' blues

IBM's announcement of the graphics-rich PS/2 could not have come at a worse time for many U.S. board manufacturers.

Profit margins, already squeezed by pressures on the volume marketing channels, were further compressed by price competition from factories in Southeast Asia.

"Margins on Enhanced Graphics Adapter products have eroded to the point that it is no longer viable to produce them," laments Jim Harris, president of board maker Hercules Computer Technology in Berkeley, Calif.

New the PS/2 has given vendors additional headaches by drastically reducing the board surface area on which chips can be placed — to roughly 30% less than what was available to

us," Burkman says.

Of course, the advent of the PS/2 will not entirely eradicate the market for graphics boards.

Indeed, vendors of such products see opportunity among PS/2 alternatives, such as Apple Computer, Inc.'s Macintosh II and the PC clones.

Some 14 million PC, XT and AT clones are now installed, indicating a substantial potential base for sales of graphics board enhancements.

Still, some major changes in marketing strategy will need to be made.

A good deal of product differentiation in the low-end segment of the graphics add-in board market has been based on price. These boards were mass-produced for a horizontal marketplace and sold via dealers, distributors and retail outlets.

The OEM factor

Now, many graphics board makers are seeking to improve margins through arrangements with value-added resellers and OEMs.

What OEMs look for, however, are solutions for specific vertical niches — solutions that

come from adding value, not just power, to application software.

Tapping the OEM market will require research and development, Harris says. "We will do it by coming up with innovative technology that will enhance the capability of the developers' software, either in terms of graphical performance or on-screen information capabilities," he says.

"You either play a dealer's game or you move to the high end to survive," agrees Mike

Clotaux, special projects director. Clotaux defines "high end" in areas such as graphics imaging, process control, medical diagnostics, computer-aided design, simulation and modeling, computer-aided manufacturing, computer-aided software engineering and computer-integrated manufacturing.

Vendors now operating in the mid-range and high end of the graphics board market will have to cope not only with a flood of new competition from companies attempting upward diversification but also with a different kind of competition from IBM. They will vie not with VGA but with the IBM 8514 display, which boasts a pixel resolution of 1,024 by 768 on the PS/2.

The market for boards with 1,024- by 768-pixel resolution will erode, some analysts say, because of IBM's 8514 entry.

Sob:al Malik, an analyst at Dataquest, Inc. in San Jose, Calif., says, "IBM has done what I call 'leading from the rear' by offering significant quality and capability. This forces vendors to enhance their products before there is an installed base."

"As the monitors come down in price, we will be playing both a resolution game and a performance game, says Steven Lary, business development manager at Vermont Microsystems, Inc., a graphics add-in board manufacturer in Winooski, Vt.

All sectors of the graphics board market show room for growth, at least through early 1989, Malik says. But vendors are already feeling the pressure, and after that point, all bets are off. ■

Messenheimer is an independent consultant and writer based in Natick, Mass., specializing in advanced technology assessment and implementation.

Caster wheel model, created on an IBM Personal Computer AT running Control Automation's Model Mate, enhanced with Orchid's Turbo PGA graphics adapter.

Floor plan, created using Autocad and the Hercules In Color graphics card.

VENDOR VIEWPOINT
Graphics upgrades: A wise investment

BY PAUL JAIN

As is always the case when IBM makes a major product announcement, a host of computing standards were created when the Personal System/2 debuted last April. In keeping with tradition, Video Graphics Array (VGA) became the de facto graphics standard when IBM incorporated it into the motherboard of its PS/2 Models 50, 60 and 90.

Just because IBM has decided that VGA is important does not mean that MIS professionals will automatically run out and upgrade their installed personal computer base to the graphics equivalent of PS/2.

There are, however, at least three compelling reasons for MIS to consider that upgrade or, at the very least, mull over an upgrade to an Enhanced Graphics Adapter (EGA). These include increased employee productivity through the use of a graphics interface, preparedness for future releases of powerful application software packages and insurance for the investment of installed PCs and PC-based application software.

One reason the Apple Computer, Inc. Macintosh penetrated the Fortune 500 is the computer's easy-to-use graphics interface. With a mouse, users interact with the computer, selecting the commands they want by moving the pointer to the command and clicking the mouse. This is certainly easier than entering programming codes to execute the same command on a DOS-based PC.

With the help of a graphics interface, employees no longer have to think about "using" the computer and can focus their attention on the task at hand, thereby enhancing efficiency and productivity.

Even word processing becomes easier when the user can see italics as italics on the screen instead of odd coding before and after the word.

Making it easier

IBM realized that its computers were difficult to use. So when introducing the PS/2 line, IBM announced it would take advantage of OS/2 and Presentation Manager as an attempt to make its computers more user friendly.

Jain is president and chief executive officer of Video Screen, Inc., a graphics board manufacturer in Fremont, Calif.

Presentation Manager, IBM's version of Microsoft Corp.'s Windows, makes all IBM computer operate much like the Macintosh. However, to run this software, and take full advantage of the machine's multitasking capabilities, the computer needs to be equipped with at least an EGA card. Since IBM introduced EGA three years ago, third parties have had time to improve on it. In response to these enhancements, IBM increased the resolution and performance of EGA to bring it to the level established by third parties. The company reintroduced EGA with the PS/2 as VGA. The PS/2 announcement made 640-by 480-pixel resolution a new standard for PC graphics.

Applying applications

Most of the software applications that will appear on the market in the next two years will be written for use with VGA. Software developers are already busy writing programs to take advantage of the advanced capabilities of the PS/2, including the new graphics standard.

Many of the new programs will not run on the old monochrome displays or even on Color or Graphics Adapters (CGA). For application programs, including advanced versions of popular spreadsheet, data base and word processing programs, VGA is a must.

In addition to protecting the installed base of more than 14 million PCs now in use, it is also necessary to consider the investment in software designed for previous graphics standards. VGA boards that feature backwards compatibility allow users to run the new high-power software applications specifically designed for VGA, while also running all software applications designed for EGA, CGA, Monochrome Display Adapter and the Hercules Computer Technology, Inc. Graphics Card.

The most obvious difference between the PS/2 and IBM Personal Computer ATs and XTs — that what appears on the monitor — the PS/2's graphics equal, or exceed, those of the Macintosh.

However, it will take more than good looks to convince MIS professionals to spend money to a trade-up. A hard look at what graphics can mean to a company will, however, soon convince the most skeptical MIS professional that upgrading PC graphics is an investment that makes sense. ■

COMPUTERWORLD

PC facsimiles are offering direct document input

BY TOM CROSS

Facsimile, or telecopy systems, better known as fax, have been in widespread use for more than 70 years. By some estimates, as many as four million fax machines are already scattered throughout the world — two million in the U.S. alone.

Personal Technology Research, Inc. in Boston estimates that close to one million fax machines will be sold in 1992, the majority of which are the subminute CCITT Group III systems. The adoption of a worldwide standard, coupled with subminute speed, has been a principal force in the recent growth of facsimile systems.

The latest fax technology twist is an add-in board that fits personal computers. PC fax boards, which fall into CCITT Groups II and III, enable documents to be sent and received as easily as they would on a stand-alone machine. According to International Data Corp. in Framingham, Mass., while just less than 17,000 PC fax boards will be shipped this year, that figure will grow to 187,000 by 1991.

Some 16 vendors currently manufacture a variety of PC fax products. But the market is still young and growing: An estimated 15 PC fax boards were introduced at Comdex/Fall '87 in November.

Two of the leading-edge products in this category are Gammafax from Gammalink Co. in Palo Alto, Calif. and Ex-Fax from DEST Gulfstream Microsystems, Inc. in Boca Raton, Fla.

The simplicity test

The real test of a product is its simplicity — whether it can be taken out of the box and used without difficulty. Both Gammafax and Ex-Fax, which consist of a board

Cross is vice-president of Cross Information Co. in Boulder, Colo., and the author of several books on communications.

and relatively straightforward manuals, are easy to set up.

In both cases, the user simply installs the board in an available slot. Minutes after software installation, the boards are ready to receive transmissions.

Both PC fax boards incorporate a telephone Y-jack to bridge the PC board and the telephone set. If you have one of the latest generation telephone key or private branch exchange sets, however, this jack probably will not work, and a separate line may have to be installed.
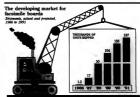
Each product's software offers key- or menu-driven functions — allowing you to send or receive, convert from ASCII to fax, print, display or scan (with an optional scanner) — and many other features.

Good with the bad

Gammafax software incorporates one quite useful feature. It automatically changes the AUTOEXEC.BAT file, which configures the PC to access peripherals. Ex-Fax provides a more concise on-screen presentation; however some of its features are not as ascending as those of Gammafax, which uses F1 keys, making all features accessible with a keystroke.

PC fax boards, relatively new to the marketplace, are still somewhat unstable. Gammafax and Ex-Fax are no exceptions. During trial runs, both locked up the system, necessitating a warm reboot.

The benefit most often mentioned by PC fax board users is savings in time. Both Gammafax and Ex-Fax certainly serve that end, but they also offer an extensive array of features that anyone productivity and convenience. For example, both offer a wide selection of diagnostic and error-correction features.

Furthermore, both boards interface to some of the available "paint" software for

The developing market for facsimile boards

Shipments, actual and projected, 1966 to 1991

THOUSANDS OF UNITS SHIPPED

1966 '87 '88 '89 '90 '91
1.2 17 50 104 156 187

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP. CW CHART: MITCHELL J. HAYES

graphics communications and major word processing packages. This allows facsimile documents to be integrated with word processing and then printed or filed for fax, electronic publishing, PC communications and other desktop applications.

Ford or Chevy

Both Gammafax and Ex-Fax allow users to get started quickly, transmit facsimile in the background while still working in the foreground and access the document once it is in the PC. The differences between the two are similar to the distinctions between a Ford and a Chevy — more matters of individual preference than of functionality.

The Gammafax system provides a feature that enables the document to rotate 180 degrees in case it was faxed upside down. Another nice feature is both systems in their ability to electronically magnify documents. This feature can be particularly helpful when resolution is poor or a faxed document is illegible.

Ex-Fax's structured menus, on the other hand, make it easier to use. It has an encryption feature, using the National Bureau of Standards Data Encryption

Standard. For modem diehards, it also has a built-in Hayes Microcomputer Products, Inc. 300 bit/sec. to 1,200 bit/sec. modem.

The greatest benefits of these or any other fax boards are apparent when they are connected to other equipment. When an external scanner is used or a PC-based board is set up to accept dial-in communications from another fax machine, all correspondence can be put into the PC. Then, if a filing program or DOS directory exists, the PC can function as an electronic desk.

Separate on- and off-line paper filing systems are not necessary. Everything can be put into the PC, copies can be made available both on-screen and by printout and documents can be archived for maintenance and accountability.

One of the most exciting prospects for PC fax boards involves their use in LAN configurations. A fax board can be installed on a file server and shared among all the workstations.

While PC fax boards may not replace fax machines, they will certainly move the facsimile out of the wirehouse or mailroom and into the front office. •

Memory expansion boards

Action Instruments, Inc.
(619) 279-5726
AICP-MEM404
A 20M-byte hard card fixed disk for IBM Personal Computer XT, and compatibles.

AICP-MEM502
A 512K-byte random-access memory expansion card for AT and compatibles.

AICP-384COM
A 384K-byte RAM expansion board for XT and compatibles.

Advanced Logic Systems
(408) 747-1988
Add-RAM, Add-RAM GS, 80/256, 80/64
Series includes 16K- or 48K- to 64K-byte memory upgrade, respectively, for the Apple Computer, Inc. Apple II and II Plus; and 256K- or 64K-byte memory upgrade, respectively, for the Apple IIe.

Apple Computer, Inc.
(Contact local Apple dealer)
Apple Memory Expansion Kits
The 1M-byte kit adds up to 1M byte of memory to Macintosh II. The 2M-byte kit adds up to 2M bytes of memory to a Macintosh.

AST Research, Inc.
(714) 553-0340
RAM
Adds 1M to 4M bytes of memory to Apple Computer, Inc. Macintosh II.

ATD/CarthBoard, Inc.
(408) 720-1942
Primary, Secondary Memory Boards
Memory expansion for IBM Personal Computer, XT, AT and compatibles adds 128K bytes to starting address of 512K bytes. Snap-on secondary board adds additional memory.

Zuckerboard Expansion Memory Board
Half cards that expand the IBM PC, XT, AT or compatibles' memory to 640K bytes.

Expanded Memory Zuckerboard
Provides Lotus/Intel/Microsoft Expanded Memory Specification for PC, XT, AT and compatibles; can be loaded with up to 2M bytes memory.

Arieto Computers, Inc.
(713) 480-6288
640K Motherboard Upgrade for IBM PC XT
Consists of two plug-in decoding chips. Up to 640K-byte upgrade.

640K Motherboard Upgrades for Compaq Portable, Zenith machines, IBM Personal Computer
Compaq upgrade consists of plug-in decoding chip. Upgrade for Zenith 150, 151, 161 similar to Compaq upgrade. IBM upgrade consists of a plug-in module and two memory connectors.

Boca Research, Inc.
(305) 997-6227
Tophat, Tophat/12
A 16-bit short card designed to enable IBM Personal Computer AT and compatibles up to 8 MHz (12 MHz for Tophat/12) to reach the maximum 640K bytes.

Bocaram/XT, Bocaram/AT
Expanded memory board for IBM PC, XT, AT and compatibles operating at up to 12 MHz. Bocaram/XT, XT/286 and true 16-bit compatibles conventional, expanded and extended memory.

Cheetah International, Inc.
(800) CHEETAH
214-757-3001 (in Texas)
Cheetah Card, Cheetah Combo, Cheetah B Crate, Cheetah Cub
All run on Intel Corp. 80286- and 386-based IBM Personal Computer AT machines. Offers zero-wait-state extended memory of 2.5M, 1.5M, 8M and 2M bytes, respectively.

CSS Laboratories, Inc.
(714) 863-8161
Turbo RAM
For IBM Personal Computer XT/286 and CSS 286-X computers. Provides up to 2M bytes memory.

Continued from previous page

Cumulus Corp.
(216) 247-2236
CE-RAM
Memory for IBM Personal System/2 supports Lotus/Intel/Microsoft Expanded Memory Specification (EMS) 3.2, EMS 4.0 and Enhanced EMS protocols.

Digiboard, Inc.
(612) 922-8055
Digiboard RAM 3M byte
For IBM Personal Computer AT and compatibles providing up to 3M bytes error-checked RAM.

Dove Computer Corp.
(919) 763-7918
Mac Snap
Memory upgrades for Apple Computer, Inc. Macintosh. Various models add 2M bytes RAM to Mac 512K, 4M bytes to Mac Plus and SE 8M bytes to Mac II.

Ehman Engineering, Inc.
(800) 257-1666
Ehman Macintosh Upgrade
Adds 256K chips to an Apple Computer, Inc. 128K-byte board to make it a 512K-byte board. Upgradable to 1M or 2M bytes.

Electro Design, Inc.
(619) 471-0680
Memcard PC Compatible 64K-256K Memory
Single-function memory board for IBM Personal Computer XT and IMP Professional. Available in 64K-byte increments to 256K bytes.

Everex Systems, Inc.
(800) 821-0806
(800) 821-0807 (Calif.)
Multifunction EMS
Runs on IBM Personal Computer, XT, AT and compatibles. Total 1M-byte memory expansion.

RAM 3000, RAM 3000 Deluxe
Runs on AT and compatibles. Total 2M or 3M bytes of memory expansion, respectively.

RAM II 2000, RAM II 4000
Runs on IBM Personal Computer 2 Models 50 and 60. Adds 2M bytes or 2M to 4M bytes memory, respectively.

Magic Magic EMS
Runs on IBM PC, PC XT and compatibles. Adds 2M bytes of memory.

Fortron Corp.
(408) 432-1191
Fortron 2M-byte, 4M-byte RAM Cards
A 2M- or 4M-byte expansion board for Intel Corp. and Intel-compatible 80386 microcomputers.

Intel Corp.
(Contact local IBM sales office)
IBM 2M-byte Expanded Memory Adapter
Provides memory or memory for IBM Personal Computer AT, 3270-PC and Professional System/2 Model 30

IBM PS/2 80286 Expanded Memory Adapter/A
A 2M-byte memory adapter for the PS/2 Models 50 and 60.

IBM Enhanced Memory Expansion Adapter
Provides expanded memory for software that adheres to Lotus/Intel/Microsoft Expanded Memory Specification 3.2. Can be installed in an PC or PC/T/286.

Iconsociates, Inc.
(617) 663-6878
Idea System Extended
Adds up to 12M bytes extended memory to IBM Personal System/2 Models 50, 60 and 80 in one slot.

Idea Supermax 30
Adds up to 8M bytes Expanded Memory Specification to IBM Personal Computer, XT and PS/2 Model 30.

Idea Supermax/EMS
Expands IBM PC, PC XT, AT and compatibles from 512K- to 16M-byte memory.

Ideamax/MC
Same as Idea Supermax 30 and Supermax/MC but without ports.

Ideamax 384, Idea Minimax
Adds 64K to 384K or up to 512K bytes RAM, respectively, to IBM PC, XT, AT or compatibles.

Image Technology, Inc.
(303) 799-6433
Short RAM Card II
Contains 256K to 512K bytes dynamic RAM for IBM Personal Computers or compatibles.

Intel Corp.
(800) 538-3373
Above Board 2 for IBM PS/2
Provides Lotus/Intel/Microsoft Expanded Memory Specification and IBM OS/2 expanded memory to 2M bytes for IBM Personal System/2 Models 50 and 60.

Above Board 286, Above Board PC
Memory expansion board for IBM Personal Computer AT and compatibles (PC, XT and compatibles for Above Board PC) running up to 12.5 MHz and the IBM PC, XT, PS/2 Model 30 and compatibles running up to 8 MHz.

Levco Corp.
(619) 457-2011
One Plus One, Monster Mac
A 2M-byte expansion board for the Apple Computer, Inc. Macintosh Plus and 1M- to 2M-byte expansion board for the Mac 128K or 512K, respectively.

Microvote Communications
Inc.
(916) 722-5158
Brainstorm Series
Brainstorm adds memory from 1M to 4M bytes to the Apple Computer, Inc. Macintosh 128K, 512K or 512E. Brainstorm XL adds 2M, 4M or 8M bytes memory to the Mac Plus, SE or II. Brainstorm II adds 1M byte memory to Mac II.

Mac Memory, Inc.
(800) 862-2636
Macplus Mega
Adds 2M bytes of memory to Apple Computer, Inc. Macintosh Plus.

Multi-51MMS
Memory expansion for Mac Plus, SE or II in sets of 2M bytes.

Mac Peak Systems, Inc.
(512) 327-3211
Plus-RAM
Adds 2M bytes memory to Apple Computer, Inc. Macintosh Plus, SE.

Mac Products USA, Inc.
(512) 832-0335
128K to 4M byte Upgrade
Upgrade offered in two configurations: Incremental expansions exclude 128K to 4M bytes for Apple Computer, Inc. Macintosh 128K and 512K to 4M bytes for Mac 512K, Plus and SE. Upgrades exclude 2.5M byte or 4M bytes for Mac SE, II or Plus and 5M byte or 8M bytes for Mac II.

MIDideas, Inc.
(415) 573-0580
Octoram, Octaram ESP
RAM cards for Apple Computer, Inc. Apple IIGS. Former offers 8M-byte RAM extension. Latter offers 512K-byte static RAM expansion.

Megahertz Corp.
(801) 485-8857
Ala Card/2
Memory upgrade for IBM Personal System/2 Models 50 and 60. Includes 2M bytes of Lotus/Intel/Microsoft Expanded Memory Specification.

Microtek, Inc.
(619) 569-0900
GL 640 Plus
Provides up to 2M bytes paged RAM for IBM Personal Computer AT, AT&T PC 6300 and most compatibles.

GL 1160
A 2M-byte expanded memory board for XT, AT and compatibles.

GL 1425, GL 1430, GL 1440
A 2.5M-, 3M- or 4M-byte extended memory board, respectively, for AT and compatibles.

GL 1476
Up to 576K of conventional RAM. Fills PC, PC XT and compatibles to 640K bytes.

The BAM-16MM
Provides 16K bytes additional RAM for Apple Computer, Inc. Apple II with 48 bytes RAM.

Microway, Inc.
(617) 746-7341
Megapage
Memory expansion board for the IBM Personal Computer, XT and compatibles.

Monolithic Systems Corp.
(303) 790-7400
Just RAM/AT, Just RAM/AT/X
Memory board for IBM Personal Computer AT and compatibles. Just RAM/AT/X uses socketed, 1M-byte chips.

Just RAM/AT/X
Provides up to 16M bytes of memory plus the option of adding 128K bytes of conventional memory for backfill.

National Semiconductor Corp.
(408) 721-8693
NS8/16
A 16M-byte expansion board for the Apple Computer, Inc. Macintosh II.

NIC Technology, Inc.
(408) 980-9511
CT-8280
For IBM Personal Computer XT and compatibles. Includes memory to bring from 0K to 640K bytes.

CT-8380
A 4M-byte Lotus/Intel/Microsoft Expanded Memory Specification card for AT and compatibles.

CT-8080A
A 3M-byte memory expansion card for the AT and compatibles.

Open Mac Enterprises, Inc.
(415) 682-0440
RAM Plus 3, RAM Plus 4
Adds 2M or 4M bytes of memory, respectively, to Apple Computer, Inc. Macintosh Plus.

RAM II, RAM II Plus II
RAM II adds 2.5M bytes of memory to Mac Plus or SE. RAM II Plus adds 4M, 5M or 8M bytes of memory to Mac Plus, II or SE.

RAM I
Adds 2M bytes of memory to Mac II.

PC Tech, Inc.
(612) 345-4555
4 Megger, 16 Megger
Offers up to 4M or 16M bytes, respectively, of expanded memory to IBM Personal Computer XT, AT and compatibles.

Profit Systems, Inc.
(313) 647-5010
Elite 16
Increases system memory from 512K to 16M bytes on Intel Corp. 80286- and 80386-based micros.

Quadram Corp.
(404) 923-6666
Liberty-PC, Liberty-AT
Liberty-PC offers up to 2M bytes expansion to IBM Personal Computer, XT and compatibles. Liberty-AT offers 4M bytes to AT and compatibles.

Quadboard-AT
Memory expansion to 3.5M bytes with two 1M-byte boards for AT and compatibles.

Expanded Quadboard
Memory expandable to 384K bytes for XT and compatibles.

Silver Quadboard
Memory expandable in 64K-byte increments to 640K bytes.

Short RAM
Memory expansion to 384K bytes.

STB Systems, Inc.
(214) 234-8750
Grand Byte
For IBM Personal Computer AT high-speed compatibles. Maximum expansion 2.5M bytes.

Rapid RAM 2,
For IBM Personal System/2 Models 50 and 60. Memory can be configured total, extended or expanded.

Super Mac Technology Corp.
(415) 964-8884
Enhance
Adds 2M bytes of memory to Apple Computer, Inc. Macintosh 512K.

Super RAM II, Super RAM II Plus
Adds 1M to 2M or 2M to 4M bytes of memory, respectively, to Mac Plus.

Tandy Corp.
(817) 390-3700
Tandy Memory Expansion Board
A board for Tandy 4000. Comes with 2M bytes memory; expandable to 4M or 8M bytes.

Techart, Inc.
(216) 349-1009
Micro Maxx, Micro RAM + 2
Adds 512K- to 8M-byte memory expansion to IBM Personal System/2 Models 50, 60 and 80. Micro RAM + 2 expandable in increments of 512K or 2M bytes.

Total Systems Integration, Inc.
(503) 345-7395
TSI-2065
Adds 1M-byte memory to Apple Computer, Inc. Macintosh Plus, SE or II.

128K-512K, 128K to 1M byte Upgrade
Adds up to 512K or 1M byte memory, respectively, to Mac 128K.

Visayn Corp.
Compupro Division
(415) 786-0909
RAM 22, 23, 24
Static RAM boards that support processors up to 10 MHz. RAM 22 extends on 256K-byte boundaries. RAM 23 on 64K-byte boundaries. RAM 24 on 1M-byte boundaries only.

Accelerator boards

COMPANY	PRODUCT	RUNS ON	MICROPROCESSOR	WORKS WITH/REPLACES MICROPROCESSOR CHIP	CLOCK SPEED (MHZ)	PERFORMANCE IMPROVEMENT	INSTALLATION METHOD	FULL SUPPORT FOR COPROCESSORS	INCLUDES NUMERIC COPROCESSOR	DEDICATED RANDOM-ACCESS MEMORY	AMOUNT AND TYPE OF DEDICATED RAM	SOFTWARE COMPATIBILITY LIMITS	WARRANTY OFFERED	PRICE
A. L. Architects, Inc. (617) 577-8002	386 Running Board	IBM PC, PC XT or 386 compatibles	80386	Works with	16, 20	300% (depending on application)	Plug-in	Yes	—	No	116-MB byte DRAM	None	90 days	$2,195-$17,200
American Computer and Peripheral, Inc. (714) 545-2004	386 Turbo	IBM PC AT or compatibles	80386	Replaces	12, 16 (doubles the processor)	300%	Plug-in	Yes	—	No		None	One-year, parts and labor	$1,199
Aox, Inc.	MasterI386	IBM PC, PC AT or compatibles	80386	Replaces		300%	Plug-in	Yes				None	Two-year, parts and labor, lifetime on microprocessor	$1,995-$2,195
Applied Reasoning Corp. (617) 492-0700	PC Elevator 386	IBM PC, PC XT, AT and compatibles	80386	Works with	16	500%-1,500%	Plug-in	Yes	Optional	Yes	1M byte (expandable)	None	One-year on hardware, 90 days on software, parts and labor	$1,995
	PC Elevator 286	IBM PC, PC XT, AT and compatibles	80286	Works with	8, 10, 12.5	500%-1,200%	Plug-in	Yes	Optional	Yes	1M byte (expandable)	None	One-year, 90 days on software	$995-$1,795
Church International, Inc. 9393 CHISTNER in TX call (214) 709-9898	CAT 286	IBM AT and compatibles	80286	Replaces	20	400%	Replace motherboard	Yes		Yes	Up to 16M byte	None	One-year, parts	$1,499
Dove Computer Corp. (900) 622-7627	Mac Snap 020 SE	Macintosh SE	68020	Works with	16	250%-1,000%	Plug-in	Yes	No	NA		None	90 days, complete replacement or repair	$899
	Mac Snap Plus 512E	Macintosh Plus, 512E	68020	Works with	16	250%-1,000%	Snap-in	Yes	No	NA		None	90 days, complete replacement or repair	$999
Everex Systems, Inc. (415) 498-1111	Hypercharge	IBM PC XT, XT or compatibles	8088-2	Replaces	8		Plug-in	Optional		No	NA	None		$199
General Computer Corp. (617) 890-0660	Hypercharge	Macintosh SE	68020	Replaces	16	400%	Plug-in	Yes	Optional	Varies according to version	1M byte Apple board	None	90 days, parts and labor	$995-$1,499
Intel Corp. (800) 538-3373	Inboard 386	IBM PC AT or compatibles	80386	Replaces	16	300%	Plug-in	Yes	Optional	As much as 1M byte DRAM		None	Two-year, parts and labor	$995 (without memory)
	Inboard 386/PC	IBM PC, PC XT, Compaq Portable, Compaq Plus, Tandy 1400HD	80386	Replaces	16	300%-1,000%	Plug-in	Yes	Optional	1M byte DRAM		None	Two-year, parts and labor	$995
R & L Industries, Inc. (412) 862-6700	Turbomax	IBM PC, PC XT or compatibles	8088-1	Replaces	9.54	More than 300%	Plug-in	No		NA	NA	None	One-year, replacements offered	$150
Juro Corp. (818) 61-2011	Prodigy Series	Macintosh 128, 512, Plus, SE	—		16	1,000%	Plug-in (SE), Snap-in (Plus, 512, 128)	Optional		Yes	1M byte-8M byte with no processor	None	One-year, parts	$399
LSE Electronics (516) 691-1670	XT 12 MHz V20 Motherboard	V20		Replaces	12		Replace motherboard	Yes	Optional	No	NA	None	One-year, parts	$105
Shartcomony, Inc. (800) 862-3536	Turbo SE	Macintosh SE	68000	Replaces	16	100%	Plug-in	Yes	Yes	4M byte		Some guaranteed	Full, one-year	$999 (without coprocessor)
	Turbomax	Macintosh 512KE or Macintosh Plus	68000	Replaces	16	100%	Clip-on	Yes		Yes	Boosts 512 to Plus to 2M byte, can boost to 4M byte by adding two 1M byte SIMMs	Some guaranteed	Full, one-year warranty	$1,999 (with coprocessor)
Mac Peak Systems, Inc. (512) 337-5211	Orion	Macintosh SE	68020	Replaces	16		SE bus	Yes	Yes	Yes	Up to 256K byte, 1M- or 4M byte 32MM	None	Full, one-year warranty	$795
	Orion 25	Macintosh SE	68020	Replaces	25		SE bus	Yes	Yes	Yes	Up to 256K byte, 1M- or 4M byte 32MM		Full, one-year warranty	Information not provided
Magnahertz Corp. (201) 489-0857	AT Turbo Switch II	IBM PC AT	NA	Works with	6-12.5	50%-75%	Plug-in	Yes		NA	NA	None	Two-year, money-back guarantee	$134.95
	PC/XT Turbo Switch	IBM PC, PC XT	NA	Works with	4.77-9	50%-75%	Plug-in	Yes		NA	NA	None	Two-year, money-back guarantee	$149.95
	286 Turbo Board	IBM PC XT or compatibles	80286	Works with	12	700%	Plug-in	Yes		4M byte		None	Two-year, money-back guarantee	$399

Dynamic random-access memory *Single in-line memory module
The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

COMPANY	PRODUCT	RUNS ON	MICROPROCESSOR	WORKS WITH/REPLACES MICROPROCESSOR CHIP	CLOCK SPEED (MHz)	PERFORMANCE IMPROVEMENT	INSTALLATION METHOD	FULL SUPPORT FOR COPROCESSORS	INCLUDES NUMERIC COPROCESSOR	DEDICATED RANDOM-ACCESS MEMORY	AMOUNT AND TYPE OF DEDICATED RAM	SOFTWARE COMPATIBILITY LIMITS	WARRANTY OFFERED	PRICE
Microtek Corp. (305) 332-7888	Mach 20 Performance Enhancement System	IBM PC XT and compatibles	80286	Replaces		200%-400%	Plug-in	Yes	No	512K	Up to 3.5M bytes	None	Two-year	$495
Microspeed, Inc. (800) 232-7888	Fast 88	IBM PC XT and compatibles	8088-2, V20	Replaces	7.4	60%	Clip-on	Yes	Optional	No	NA	None	One-year, and later	$129-$149
Microway (617) 746-7341	Fast Cache 286	IBM PC XT and compatibles	80286	Works with	8, 12	300%	Plug-in	Yes	Optional	No	NA	None	Two-year, and later	
	Super Cache 286	IBM PC XT and compatibles	80286	Works with	12	100%	Plug-in	Yes	Optional	No	NA	None	Two-year, and later	
	Number Smasher ECM	IBM PC XT and compatibles	8088	Replaces	9.54, 12	400%	Plug-in	Yes	Optional	Yes	1M byte for ECM	None	Two-year, and later	From $1,244
	287 Turbo	IBM PC XT and compatibles	80286	Works with	7.4	100%	Plug-on	Yes	Optional	No	NA	None	One-year, and later	From $116
	287 Turbo Plus	IBM PC AT		Works with	Up to 11.5	300%	Plug-in	Yes	Optional	No	NA	None	One-year, parts and labor	From $159
	Monoputer	IBM PC XT, AT and T-800	Works with			3,000%	Plug-in	Yes	Yes	Yes	2M bytes	None	One-year, parts and labor	$1,500-$2,000 (Includes 2M of compatible)
Monolithic Systems Inc. (303) 790-7400	Microframe 386	IBM PC AT	80386	Replaces	16, 20	200%	Replaces motherboard	Yes	Optional	Yes	Up to 8M bytes	None	One-year	$3,245
Network Specialties, Inc. (415) 467-8411	Jump 860	Macintosh Plus, 810	68020	Works with			Clip-on	Yes	Optional	Yes		128-bit full technical support	$800 for 68020
Navy Systems, Inc. (904) 427-2358	Max 20 MX	Macintosh 512E, SE, Plus	68020	—	12, 16, 20, 24	200%	Plug-on	Yes	—	Yes	1M-4M bytes rack	Six-month money-back	$595-$4,990
Orchid Technology Co. (415) 683-0300	PC Turbo 286e	IBM PC XT, AT and compatibles	80286	Works with	10	300%	Plug-in	Yes	Optional	No	1M byte	None	Five-year	$1,295
	Jet 386	IBM PC XT, AT and compatibles	80386	Works with	8, 12	450%-700%	Plug-in	—	Optional	—	1M byte	None	Four-year	$445-$685
	Jet 386	IBM PC XT, AT and compatibles	80386	Works with	10	300%	Plug-in	Yes	Optional	Yes	64K bytes	None	Four-year	$1,295
Opus Systems, Inc. (408) 446-2110	Series 110 Personal Mainframe	IBM PC AT and compatibles	32032	Works with	10	400%	Plug-in	Yes	Yes	Yes	2M or 4M bytes, 256K byte	30 days, parts and labor	$1,995
	Series 220 Personal Mainframe	IBM PC AT and compatibles	32332	Works with	15	800%	Plug-in	Yes	Yes	Yes	4M, 8M, 16M bytes; 1M-bit DRAM	90 days, parts and labor	$3,995
	Series 240 Personal Mainframe	IBM PC AT or compatibles	Clipper	Works with	25	1,600%	Plug-in	Yes	Yes	Yes	4M, 8M, 16M bytes; 1M-bit DRAM	90 days, parts and labor	$6,140
	Series 350 Personal Mainframe	IBM PC AT or compatibles	Clipper	Works with	30	2,000%	Plug-in	Yes	Yes	Yes	4M, 8M, 16M bytes; 1M-bit DRAM	90 days, parts and labor	$7,640
PC Technologies, Inc. (800) 821-3086, (313) 996-9690 outside U.S.	286 Express	All 8088 based microcomputers	80286	Replaces	8, 12, 16	200%-400%, depending on application	Plug-in	Yes	Optional	NA		None	Two-year, parts and labor	$445-$795
	RAM Razor	Any 8088 based microcomputer	80288	Replaces	8	200%-400%, depending on application	Plug-in	Yes	Optional		2M bytes expanded memory	None	Two-year, parts and labor	$999
	386 Express	IBM PC AT		Replaces	16	200%-300%	Plug-in	Yes	Optional	NA		None	Two-year, parts and labor	$1,195
Quadram Corp. (404) 923-6666	Super Sprint 286	8088 based IBM PC, XT or compatibles	80286	Either	12	Up to 300%	Plug-in	Yes	Optional	No	NA	None	One-year	$545
	Quadsprint	IBM PC, PC XT and 8088	8088	Replaces	8	More than 100%	Plug-in	Yes	Optional	No	NA	None	One-year	$345
	Super Sprint 286 Accelerator Board	IBM PC, XT or compatibles	80286	Replaces	4.77, 8, 10, 12	300%	Plug-in	Yes	Optional	No	NA	None	One-year	$545
Radius, Inc. (408) 434-1010	Radius Accelerator	Macintosh Plus, SE	68020	Works with		400%	Clip-on (Plut. Intrvml expansion port GU)	Yes	—	No	NA	None	Instant	$695
Sigma Designs, Inc. (415) 770-0100	Turbo Cache 286	IBM PC, PC XT and compatibles	80286	Replaces	10	40% to 1,000%	Clip-on	Yes	Optional	Yes	NA	None	One-year, parts and labor	$649
Total Systems Integration (503) 345-7395	TSI-020	Macintosh 512E, Plus, SE	68020	Works with	12, 16, 20, 24	400%	Clip-on	Yes	Optional	Yes	12K, 4M bytes	90 days, parts and labor	$600 (12 MHz, no RAM)

Windows open to 80386 power

High-octane Microvaxes roll

Lack of unity endangers the promise of DAT

BY JAMES A. MARTIN

Unisys adds 1100/90 models

Storage Tech boosts solid-state

Codex reveals net manage

AT&T spells out net control

BY ALAN ALPER and ELISABETH HORWITT

DB2 advantages require hard s

Wang takes Ethernet plunge

BY ELISABETH HORWITT

NEC releases hard-disk Multispeed lapto

MAP users group lays down law

Broker workstation tool

Hot future for DP pros

BY KATHY LUBS

IBM slow to reme   aky DB2 security

HAYES ANN
TECHNOLOGICAL
MODEMS THAT IM

It has been said that even the best of technology eventually becomes obsolete. A notion that we at Hayes could never really understand. And certainly never accept. So in defiance of it, we created the V-series Smartmodem 9600™ and V-series Smartmodem 2400.™ Modems that actually get better as they get older. Because they not only incorporate the most intelligent features found in modems today, they also possess the capability to provide a long term growth path into the communications environments of tomorrow.

V-SERIES SMARTMODEM 9600

This is the fastest modem we've ever made. It can send and receive data at 9600 bps and with adaptive data compression achieve an effective throughput of up to 19200 bps. Point to point error control, forward error correction and data flow control ensure that data gets there accurately.

The V-series Smartmodem 9600 also comes with automatic feature negotiation, a self-operating capability that analyzes all options for modem link and then selects the optimum feature set with any Hayes modem for the most efficient transmission at the highest shared speed.

Synchronous and asynchronous communications modes as well as simulated full duplex employing advanced CCITT V.32 trellis code modulation and fast turnaround ping pong technology are also part of the package. Plus you'll get the capability to link up with a range of networks including SNA. And soon V-series technology will offer an X.25 PAD option to further accommodate network environments of today. And the future.

(ᖲ) Hayes

Bennett

advent of DB2 caused many user compa-
nies to defer purchase decisions until they
had tested IBM's latest entry in the data
base derby.

"We could have survived as an inde-
pendent company, but we would not be as
strong as we are today," Bennett says of
the acquisition, one of the apparent smart
moves by a regional Bell holding company
into the computer business. "There is no
way to fund a company when expenses
are growing at 30% to 40% and revenue
growth is only at 15% to 20%."

Bennett, a World War II air force pilot
and graduate of the University of Virgin-

ia, joined ADR in 1966 as a manager of op-
erations and marketing at the behest of a
friend, Dick Jones, the firm's second pres-
ident. At the time, ADR was a small pro-
fessional services company that did pro-
gramming and consulting for the
government and large commercial users.

The company had already decided it
wanted to be a systems software firm, but
it needed a strong marketing push. To
help get ADR quickly off the mark, Ben-
nett used the sales and marketing experi-
ence he had gained at the former Bur-
roughs Corp., then Sperry Corp.'s Univac
division, and Collins Radio, now a tele-
communications subsidiary of Rockwell
International Corp. "My first job was to
convince the world to buy software," he
recalls. "The problem was that it was

hard to convince people to buy something
that you couldn't see or own."

In 1970, Bennett replaced his friend
Jones as president and chief executive of-
ficer. It was a landmark year for ADR.
The firm reached an out-of-court agree-
ment with IBM on a suit it had filed charg-
ing that IBM's bundling of software with
hardware resulted in unfair advantage.
The agreement followed a similar U.S.
Department of Justice decision and result-
ed in an undisclosed financial payment.

With those funds and proceeds from
the sale of ADR's service bureau, time-
sharing and turnkey systems businesses,
Bennett was able to put the firm's finan-
cial house in order and focus the company
on what it did best — systems software.
The firm developed products like Librari-

an and acquired two companies, including
Datacom, Inc., the firm that developed
the kernel for its Datacom/DB DBMS.

Bennett credits Bennett with trans-
forming ADR from a small company ob-
sessed with technology into a world-class
competitor. "Like any company formed at
that stage in the industry, ADR was
founded by technically oriented entrepre-
neurs," Broadview's Goldstein says. "He
brought professional management and or-
ganization to the company. Those skills
were needed." Others, however, say
Bennett was a smooth salesman who cul-
tivated strong customer relations but did
little of the strategic planning and man-
agement of the company.

Bennett says he feels that, with the
backing of Ameritech and recent en-
hancements to Datacom/DB and Ideal, its
applications development product [CW,
Sept. 21], ADR is well positioned for the
future. "The groundwork has been
done," he says. "I don't feel I'm leaving
any customers holding the bag."

Martin

waiting to happen, but few, if any, U.S.
companies are eager to pounce.

Although nearly every compatible
maker is reportedly developing a PS/2
Micro Channel clone, they all are waiting
for the other guy to make the first move.
Nobody wants to incur the wrath of
IBM, which has made it quite clear that it
did not appreciate losing all that PC mar-
ket share and that its new, highly propri-
etary boxes will be guarded as fiercely as
the recipe for Coca-Cola.

Several of the offshore firms, little-
known here but well-funded back home,
are potentially strong enough to take a
hit from IBM, if necessary. At any rate, a
lawsuit from Goliath IBM is bound to be
tied up in litigation for quite some time.
Meanwhile, there's the chance to be
first to market — always the name of the
PC game — grab some headlines and in-
crease market share in the country that
counts. Why would a Compaq, which is
cleaning up on the current DOS-standard
micro environment that IBM made pos-
sible, want to take that risk?

Clearly, IBM will need a certain num-
ber of PS/2 compatibles out there to help
perpetuate what it hopes will be the new
microcomputing standard. Even IBM
can't do that by itself. In the meantime,
is it possible that companies such as Mul-
titech and Mitac can establish a strong
foothold in the PS/2 market to the detri-
ment of overly cautious U.S. companies
that waited too long on the sidelines?

These questions and more could easi-
ly be cleared up if IBM would outline pre-
cisely what its plans are as far as litiga-
tion and patent licensing are concerned.

IBM's silence is godlike, omnipotent
and disturbing. It's also excellent compet-
itive strategy. But in this era of huge
trade deficits and increasing "Buy Ameri-
can" attitudes, U.S. companies need to
make a collaborative effort to keep as
much of the U.S. market to themselves
as possible. If IBM inadvertently enables
offshore companies to gain further in-
roads into the battered U.S. economy, its
clever posture of silence could ultimate-
ly be met with a few angry voices.

*Martin is a Computerworld West Coast corre-
spondent.*

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EDI setting standard for future

Widespread use of document exchange bodes well for versatile MIS pros

BY PATRICIA TAYLOR
SPECIAL TO CW

What do U.S. auto makers, the retail industry, transportation companies and financial services firms have in common?

They are all implementing versions of electronic data interchange (EDI) — a set of communications standards that allow business to be conducted electronically between companies over computer networks.

The promulgation of EDI and its acceptance by major leading corporations in creating a demand for MIS professionals trained in the data communications and business skills necessary to implement industry-specific document exchange standards.

Crossing boundaries

Because EDI crosses all the boundaries of a business — requiring MIS support as well as cooperation from line managers — it can become a very political issue. The task involves organizational challenges as well as technical ones, says consultant Victor Wheatman of Input, Inc. in Mountain View, Calif.

Much as the current wave of personal computer experts developed as more and more companies installed PCs, EDI experts are evolving as their companies turn to electronic invoicing, ordering and payment, Wheatman says. These experts are coming from both the information systems and end user areas.

The advantage these professionals possess is that since EDI is based on ANSI standards, their knowledge of the area will be transportable from one company to another, significantly enhancing their career opportunities.

Unlike other information systems standards, EDI is not part of the regular curricula that make up most MIS education programs. This lack of structured training means that the developing field is wide open to newcomers who can learn what they need to know by attending industry-specific seminars, offered by EDI standards organizations like the Transportation Data Coordinating Committee in Washington, D.C.

Responsibilities

The EDI expert provides a workable solution for communication across systems using the universal EDI syntax, according to Bob Parks and Kent Feiler of Interchange Systems, Inc. in Chicago. To accomplish this task, an MIS professional must combine elements of his information systems background with business organizational skills.

Such an expert is charged with implementing software, which is developed using a format specific to EDI, to address business applications such as purchasing, accounts receivable and accounts payable.

The software programs usually run on existing computer systems. Although a basic understanding of communications technology and ANSI X.12 standards is necessary, the real challenge arises when integrating EDI into already existing application areas. An ideal candidate for an EDI-related position will possess both programming and business skills.

The First National Bank of Chicago, which implemented EDI in November 1985, drew on professional talent from all the operating areas within the bank for the project, spokeswoman Carol King says.

These professionals included information systems staff as well as an outside consulting firm. The project proved so successful that First Chicago is now marketing its EDI software as a separate product. The staff, originally housed in one of the bank's operational areas, is now part of a separate division.

> ## IN THREE TO FOUR YEARS, the EDI standards will be common knowledge. It will be like knowing Cobol.
>
> JOHN KANE
> ROCKWELL INTERNATIONAL CORP.

EDI is the next logical step in data communications, Feiler and Parks say, and professionals who are well versed in the syntax will be able to compare themselves to business travelers who have mastered the English language vs. a less universal dialect.

Coming attraction

"In three to four years, the EDI standards will be common knowledge," says John Kane, manager of administrative systems at Rockwell International Corp.'s automotive operations in Troy, Mich. "It will be like knowing Cobol, and it will be easier to find more and more people who understand something about it."

Rockwell's automotive operation receives orders and sends invoices over an EDI network as part of the automotive industry's effort to implement electronic document exchange. While less staff is required on the clerical side of the company, Kane's department implemented EDI using current staff members.

Kane sees the need for EDI expertise as a short-term phenomenon. "It's relatively new, so understanding EDI standards is a plus for information systems professionals today," he says.

The mystery disappears

But once people develop sufficient overall communications and business knowledge, EDI standards by themselves will not oblige a company to hire an EDI expert, Kane says. "There is a not a whole lot of mystery to the standards," he adds. "A good analyst can understand them."

Another way MIS professionals can develop a career based on EDI is by going to work for a vendor of EDI products or becoming an independent consultant in the field. A number of companies, including McDonnell Douglas Corp, IBM and GE Information Services, a division of General Electric Co., offer products that conform to EDI standards.
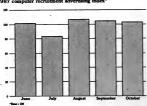
According to a recent study by Input, the market for EDI software and services will grow from $50 million this year to more than $1 billion by 1990.

Taylor is an associate with the Center for the Study of Data Processing at Washington University in St. Louis.

CAREER INDEX

1987 computer recruitment advertising index*

*Base = 100

October 1987 computer recruitment advertising activity*

PERCENT OF SPACE PLACED BY VENDOR VS. USER COMPANIES

	National	Western region	Midwestern region	Eastern region
	65.5	67.4	56.6	41.5

■ Vendor ■ User

Analysis of computer recruitment advertising space in Computerworld and selected U.S. newspapers

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ROBERT HALF
DATA PROCESSING

"Founder of Robert Half International Inc. and author of "Making It Big in Data Processing," Crown Publishers (July 1987).

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Issue Date: December 28/January 4

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To help you get your product classified advertising off to a good start in 1988, we're making you two money-saving offers:

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- **FREE** inch for every two inches you run on Computerworld's MARKETPLACE during the entire first quarter of 1988. Bonus inches are based on and added to each insertion.

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- Return the enclosed order form with your ad material in the postage-paid envelope provided.
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Issue & Closing Dates

Computerworld is published every Monday; ad space and material closing date for the Product Classified MARKETPLACE is Friday, 10 days prior to issue date.

Rates

Open Rate:
$185 per column inch. Minimum ad size accepted for Computerworld Product Classified MARKETPLACE is 2 column inches.

Frequency Discount Rates

To earn frequency discount rates, a Computerworld Product Classified MARKETPLACE contract must be signed and returned to your sales representative of the Computerworld Billing Department in Framingham, MA. If a contract is not submitted, all Computerworld MARKETPLACE ads will be billed at the open rate of $185.00 per column inch.

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All Computerworld Product Classified MARKETPLACE advertising is agency commissionable.

Computerworld Product Classified MARKETPLACE Frequency Discount Rates

(applies to ads totaling four column inches or more)

	1x	7x	13x	26x	51x
Cost per column inch	$185.00	$176.00	$170.00	$165.00	$157.00

Mechanical Requirements

Minimum Depth Requirements: *

Number of Columns	Width	Minimum Depth
1	1-13/16"	2"
2	3-3/16"	2"
3	5-13/16"	2"
4	7-13/16"	7"
5	9-13/16"	7"

* Ad depth sizes are available in 1/2" increments.

Camera-ready art or negatives are preferred. Negatives must be right-reading, emulsion side down. 85-100 line screen recommended.

Copy: Typesetting available at no extra charge. Please attach clean typewritten copy, with approximately 25 words to a column inch, not including headlines or border artwork. Any special artwork should be enclosed with your copy. Logos must be submitted on white bond paper for best reproduction.

Shipping Instructions: Send all copy, artwork and insertion orders to: Computerworld MARKETPLACE, P.O. Box 9171, Framingham, MA 01701. Please specify on your insertion order in which MARKETPLACE section your ad is to run.

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Please be sure to mark material you are sending via telecopier — "Computerworld Product Classified MARKETPLACE" and in which section you wish your ad to appear.

STOCK TRADING INDEX

Indexes	Last Week	This Week
Communications	80.0	80.4
Computer Systems	79.1	79.7
Software & DP Services	89.2	87.3
Semiconductors	49.0	52.2
Peripherals & Subsystems	68.2	67.7
Leasing Companies	83.6	79.8
Composite Index	74.0	74.1
S&P 500 Index	95.2	97.4

Communications

Computer Systems

Software and DP Services

Semiconductors

Peripherals and Subsystems

Leasing Companies

CW CHARTS: AMT J. SWANSON

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 9, 1987

Communications and Network Services

Semiconductors

Peripherals

Computer Systems

Leasing Companies

Software & DP Services

Sun needs prep time for OS

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. users are eagerly awaiting a new operating system for the Sun-3 and Sun-4 workstations, a version promised to some customers by year's end.

According to John Hime, Sun's hardware marketing director, SunOS Version 4.0 will not be available to users for another seven to eight months.

Hime said Sun had told selected customers of SunOS 4.0's pending release. However, Sun developers have discovered that "there's a lot more work to get these new features into the OS," he added.

'Nudging' Sun

Sun received some gentle criticism from customers at a gathering last week of Sun users in San Jose, Calif. "It's been more like nudging," said R. Miles Waugh, manager of the computer applications division for Philip Morris U.S.A. "It's not gotten to the point where people are saying they will switch vendors. There's a lot of loyalty for Sun out there."

John Kinyon, engineering group leader for Motorola, Inc.'s Cellular Group, said criticism may stem more from a desire to have the latest whiz-bang capabilities than from a need.

"I've got enough to keep me busy right now," Kinyon said. "I suspect we will have Version 4.0 up and running before a lot of applications will be ready. But, like everyone else, we can't wait."

Specifics lacking

Sun's Hime declined to offer specifics on the new operating system, saying that it has not been formally announced. Since Nov. 30, SunOS 3.2 has been available on the Sun-4 workstation, which began shipping in recent months. No beta-test versions of SunOS 4.0 have been shipped, Hime added.

Rich Edwards, an industry analyst for Robertson, Colman & Stephens, said SunOS Version 4.0 will offer "the first convergence" with AT&T's Unix System V, Release 3.

Users said they are impatient to get their hands on the new operating system.

"I'm always anxious to get the latest and greatest operating system," said Jim Forger, a systems engineer for Eastman Kodak Co. "But if it's not out by the spring, I'll start running into problems."

Dexpo vendors mad as wet hens

Some exhibitors chafe after being put in outdoor rain-soaked tent

BY JAMES A. MARTIN
CW STAFF

ANAHEIM, Calif. — Several third-party Digital Equipment Corp.-compatible vendors were surprised and angered last week to find that their Dexpo West '87 booth space was not located on a conventional trade show floor but inside a rain-soaked tent in a parking lot.

"We were told our space would be in Hall B, a temporary structure, and of course we assumed that meant some kind of climate-controlled building," said a Convex Computer Corp. spokesman who asked not to be identified.

Of those exhibitors interviewed, none reported actual computer equipment damage, but they did not rule out the possibility.

"Our C1 XP super minicomputer is an expensive piece of equipment to be running on water in a parking lot," the Convex spokesman said.

Cloudburst

A rainstorm swept through Southern California Dec. 4 and 5, just before and at times during some 200 exhibitors' efforts to set up for Dexpo in makeshift exhibition space outside the Disneyland Hotel here. The tent structures housed more than two-thirds of all the Dexpo exhibits.

The waterlogged situation was apparently aggravated later by cleanup crews, whose efforts to sweep away standing rooftop rainwater actually caused more water to seep onto the show floor.

Because of the rains and leaking rooftop, some exhibitors said the costs of convention setup were doubled.

"Normal setup costs are around $5,000 to $6,000, but with the expense of drying our booth out, protecting it from the rain, the labor in moving our computer equipment and the unexpected costs of a hotel suite, it will cost us around $10,000 to $12,000," said Lynn Neff, manager of trade shows for Informix

Software, Inc.

New exhibitors this year claimed they did not know their booth space would be in a tent. Steven Barth, vice-president of marketing for Dexpo organizer Expoconnal International, Inc., said there had been some misunderstandings about Expoconnal's description of the booth space as a "semirigid temporary structure."

"Technically, it's not a tent, and we didn't call it one. But a lot of people didn't know what it would be because of that description," Barth said.

Next year's Dexpo West will also be held in Anaheim and will again require a temporary structure to house exhibits, Barth said. Plans have already been made to contract for the same tent structure again next year, but modifications will be made to ensure that this year's problems are not repeated.

Ada's commercial course accelerates with intros

BY ROSEMARY HAMILTON
CW STAFF

BOSTON — The Ada programming language took some small steps into the commercial market last week with the help of a few announcements from mainstream vendors at Ada Expo '87, a conference and trade show held here.

The Ada base management vendors, including Oracle Corp., announced interfaces to the Ada environment. At least two vendors, including Alsys, Inc., introduced Ada products for Apple Computer, Inc.'s Macintosh and said they would target the offerings at commercial customers.

Ada's move into the commercial arena has long been expected by some observers, but it has yet to meet some users' expectations.

Christened as the standard programming language by the U.S. Department of Defense,

Ada has apparently proliferated in certain overseas markets, including Europe. Ada won a new lease on life when the DOD reemphasized its commitment to the language earlier this year.

"We have been expecting it to spread in the [U.S.] commercial market, but there was little indication of it there," said consultant Kenneth Bosomworth at the Ada Expo show.

Bosomworth, president of International Research Development in Norwalk, Conn., said his firm has been tracking Ada's growth in Europe. He summed up Ada's presence in the U.S. commercial market by saying, "It just isn't happening here."

Edward Berard, an Ada advocate who served on the Executive Committee of Ada Expo, said he remains confident that the language will be accepted one day by traditional data processing shops.

"There's no doubt it will be a

gradual introduction" to DP shops, said Berard, who is president of EVB Software Engineering, Inc. in Frederick, Md. "But it is making small inroads."

Announcements made last week at the show included the following:

• Oracle released Pro Ada, a program that reportedly allows users to embed SQL statements into programs written in Ada. With the SQL statements, the Ada programs can access the Oracle relational data base management system. Pro Ada will run on Digital Equipment Corp. hardware. It requires DEC's Ada compiler and Version 1.1 of the Oracle DBMS.

• Computer Corporation of America said it is shipping an interface that links the Ada environment to its Model 204 relational DBMS. The interface will allow Ada programs to directly access and retrieve data. It is set to be available in January as a free feature of Model 204.

• Rational, a Mountain View, Calif.-based company that makes an Ada development system, announced it will jointly market its product with IBM for IBM's 4381 and 9370 platforms.

Lotus sues ad firm over trade secrets

Microsoft blows whistle on alleged offer

CAMBRIDGE, Mass. — Lotus Development Corp. filed suit against a Boston advertising agency Friday, alleging that the firm offered "to sell Lotus's trade secrets and confidential information" to Lotus rival Microsoft Corp.

According to Lotus, the Boston-based advertising agency Rossin Greenberg Seronick and Hill, Inc. attempted to get the Microsoft advertising account by offering confidential Lotus information. But instead of using the information against Lotus, Microsoft gave copies of an incriminating letter and an explanatory brochure to Lotus.

'Intimately acquainted'

In the brochure sent to Microsoft's director of corporate communications, the agency allegedly wrote, "The reason we know so much about Lotus is that some of our newest employees just spent the past year and a half working on the Lotus business at another agency.

"So they are intimately acquainted with Lotus's thoughts about Microsoft," the brochure continued.

Lotus also named James Manfre and Jay Williams in the suit. Both are former employees of Lotus's advertising agency, Leonard Monahan Saabye in Providence, R.I., who now work for Rossin.

Rossin officials were unavailable for comment at press time.

Lotus sought injunctive relief and unspecified damages.

Rodime settles one 3½-in. drive suit

BY CLINTON WILDER
CW STAFF

GLENROTHES, Scotland — The stockpile of lawsuits lodged by Rodime PLC against various manufacturers involving 3½-in. disk drive technology patents was reduced by one last week. Rodime and market leader Miniscribe Corp. reached an out-of-court settlement in a lawsuit filed by Rodime.

Rodime's suits against IBM and Conner Peripherals are still pending. In each of the three actions, Rodime has claimed that it

developed the 3½-in. drive technology and that other vendors using it must license the technology from Rodime [CW, March 2, March 30, June 22]. Rodime also mailed written warnings to approximately 20 other vendors asserting similar claims.

Longmont, Colo.-based Miniscribe agreed to pay Rodime for a license, which includes a cross-license under each of the company's existing patents. Both companies refused to disclose specifically what technology Rodime will be licensing. The firms will continue to compete in the

3½-in. drive market.

Although the amount of payment was not disclosed, disk drive industry analyst James Porter speculated that it may be very small.

"This suit has had very low credibility in the industry," said Porter, president of Disk/Trend, Inc., a research and consulting firm in Mountain View, Calif. "Rodime is essentially claiming a patent on making a disk drive smaller. This [settlement] sounds to me like an attempt by both companies to cut down their legal bills."

VAX

CONTINUED FROM PAGE 1

third-party DEC-compatible trade show held here last week.

The new VAX system's increased performance will come from a combination of software and symmetrical multiple processing, which is the ability to assign one application to each of several processors. No pricing details were given, and Demmer would say only that the next VAX 8000 system would be released before the end of DEC's 1988 fiscal year in June.

VAX crystal ball

Although Demmer did not elaborate on Polar Star, he did sketch out DEC's intentions for the VAX family and VMS operating system during the rest of the 1980s and early 1990s.

For example, Demmer said, DEC is developing a distributed systems architecture to be implemented by the early 1990s that will support a multivendor environment and feature the International Standards Organization's Open Systems Interconnect (OSI) networking standard as a major component. OSI will be incorporated at the operating system level, Demmer said. This will enable DEC systems to offer simplified interfaces to other operating systems, including Microsoft Corp.'s MS-DOS and OS/2 and AT&T's Unix System V.

Demmer said DEC's VMS operating system will be "only one element of the future distributed systems architecture we are attempting to define."

He said the biggest change in the works for the VAX environment is increasing the current 32-bit memory addressing limitations. By the early 1990s, DEC hopes to go beyond the VAX's 32-bit ceiling with an expanded systems architecture.

Demmer would not say exactly how the expansion would be achieved. He said DEC currently has two reduced instruction set computing (RISC) projects moving through research and development. "We're not at the point where RISC will provide anything better than VAX, but we are exploring opportunities to get above memory and address

limitations of the 32-bit structure," he said.

Demmer added that "the VAX architecture can go into the next century, but whether it will be DEC's premier architecture is not certain."

In the meantime, DEC is experimenting with vector processing capabilities. "We have a 64-processor Microvax running on a single bus, but the real question is, What applications will lend themselves to parallel processing?" Demmer said.

He said there were no immediate plans for vector or parallel processing abilities but added that DEC believes the potential "is so enormous that we are spending a lot of R&D dollars on it until it becomes a reality in the 1990s."

Lukewarm reception

Users interviewed at the Decpro show expressed only modest interest in Polar Star.

"I guess it's a good idea for DEC to offer something like a mainframe if they want to get IBM's customers, but most of us bought DEC because the departmental system is what worked best," said the director of computing for a California hospital, who asked not to be identified.

Leonard Hermark, public health engineer for the Maricopa County Department of Health in Phoenix, said that although a mainframe system would not be of interest to his particular department, it would be to the county hospital as a whole.

"The question arises of would we stay with a departmental system or go with distributed computing by departments. We would probably stay away from mainframes, although other areas within our organization need to move to larger and larger equipment," Hermark said.

The concept of multivendor connectivity through the DEC operating system was especially appealing to users.

"If we could access other systems through the operating system and not have to add all sorts of networks and software, it would certainly make things easier," Hermark said. "Every time you add more software, it adds more time, and you lose flexibility."

DEC dangles key to VAXBI lock

Will it or won't it open the VAXBI? Only DEC knows for sure.

With the answer to that question still uncertain, Digital Equipment Corp.'s proprietary VAXBI bus was the main topic of discussion during Decpro West '87 and the Digital Equipment Corp. Users Society users group meetings held concurrently here last week.

Users also prodded DEC to improve its abilities to manage clusters as a connect to non-DEC machines.

The VAXBI bus, used in the VAX 8000 series, is the only DEC bus not generally available for third-party development. DEC chooses which third-party products are sold for the VAXBI.

Some users said last week they would not consider a VAX 8000 series model because of the limits imposed by DEC. However, they said they believed DEC would eventually find enough pressure from users and third-party vendors to license its VAXBI bus more freely.

High hopes

"There have been a lot of comments about the BI bus this week, but I'm not really worried about it, because I think DEC will change its stance in the not-too-distant future," said Robert Byers, director of computing services for Jackson Community College in Jackson, Mich.

Opening up the VAXBI bus to outside development is an ongoing discussion at DEC, but the company has no definite plans to change its policies, according to Bill Demmer, vice-president of DEC's Mid-Range Systems Business Group in Roxboro, Mass.

While some users said they did not want to be

dependent on DEC alone, others said they had little faith in third-party developers offering worthwhile alternatives.

"When there's a problem with a third-party peripheral on DEC [hardware], you sometimes don't get much sympathy from either side," said William Bergstrom, a programmer/analyst for the U.S. Air Force in Tucson, Ariz. "The support from the third party is not always very good, and DEC is not very forgiving when you've bought a competitor's product instead of theirs."

Clusters and compatibility

One user said he would like to see DEC provide a way to manage a VAXcluster from one station in a future VMS release.

"The way it is now, we have to set up each of our VAX 8600s so they can talk to each other. Each machine uses its own systems parameters and is booted differently, and you have to make sure they don't conflict with each other," said John L. Meler, a computer scientist with Computer Sciences Corp. in San Diego.

"VMS needs more of a cluster concept," Meler added.

Better compatibility with non-VAX systems, especially the Apple Computer, Inc. Macintosh, is also on users' Christmas lists.

One user said he would like to see DEC and Apple join together in a joint development project that would benefit those customers who use both companies' systems.

"While DEC and Apple management feel pretty good about each other, there is no special activity for a joint development between the two at this time," Demmer said.

JAMES A. MARTIN

Real-time offerings get another boost

MARLBORO, Mass. — Digital Equipment Corp. last week extended its real-time computing capabilities by enhancing its VaxELN software and packaging the 3-month-old Vaxstation 3500 with its Vaxlab offerings.

VaxELN Version 3.0 supports three new runtime systems — the Microvax 3500, the Microvax 3600 and the VAX 8800 — and includes new tools for development and runtime environments.

DEC enhanced the Vaxlab Data Acquisition and Analysis systems to include support for DEC Q-bus-based Microvax systems. The vendor said device-dependent real-time applications can be migrated between Q-bus- and DEC VAXBI-based configurations with little or no reprogramming.

Enhancements to DEC's Vaxlab Scientific Workstation family include support for serial I/O and an IEEE 488 bus and

a Q-bus analog-to-digital converter, the 32-channel ADQ32 with data acquisition speeds of up to 200 KHz.

The base price for a Vaxlab/ Vaxstation 3500 is $62,000. Base prices for VaxELN Version 3.0 software, including tool kit and runtime licenses, range from $1,470 for a Vaxstation 2000 Toolkit and a Microvax II Runtime system to $14,600 for a Vaxstation 2000 Toolkit and a VAX 8800 Runtime system.

Feds require PCs for disabled

WASHINGTON, D.C. — Guidelines to ensure that federal employers with disabilities can use personal computers and other electronic equipment were announced last week by the U.S. General Services Administration (GSA).

The guidelines, developed by the GSA and the U.S. Department of Education, are intended for use by managers at federal agencies and to show vendors what features the government will require in future contracts.

The guidelines call for larger-print displays for users with poor vision and cursors with an adjustable "blink rate" to accommodate workers with learner disorders who may be sensitive to certain frequencies of flashing light. With the increasing importance of screen graphics, the document said, the government eventually will require that "screen information can be extracted, interpreted and presented in speech or tactile form" for blind users.

TRENDS

Application backlogs

Application backlogs melting slowly at IBM OS mainframe sites

PERCENT OF SITES BY BACKLOG (IN MONTHS)

	1984			1987	
34.7%	26.3%	20.5%	18.6%	14.1%	15.1%
Less than 36	12 to 36	36 to 36		43.2%	27.6%

In a survey of top data processing managers, Focus Research, Inc. found that the application backlog has shrunk at many large mainframe sites during the last three years and is greater than 36 months at only 14.1% of the sites, compared with 20.5% three years ago.

The same held true for DOS sites, which tend to have less sophisticated users and are equipped with smaller mainframes than those running IBM's MVS.

In DOS shops, 7.1% reported a backlog of more than 36 months, compared with 15.2% three years ago. Almost 60% said their backlog is less than 12 months, compared with only 47.2% in 1984.
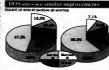
Focus spokesman John Cook could not pinpoint why the backlog is shrinking, but conversations with DP directors suggested two reasons: the practice of buying applications commercially and the fact that the use of development tools, such as fourth-generation languages, is more widespread.

In a related portion of the survey, the West Hartford, Conn., market researchers found that CASE tools are most prevalent in the sites with the largest backlogs, which would seem to indicate that advanced development tools do little to ease the backlog. However, Cook pointed out that CASE tools tend to be in use at the most sophisticated shops.

"The OS shops are more willing to try out new technology. Because they already have the biggest backlog, they are trying out the tools," Cook noted.

CHARLES BABCOCK

DOS sites see similar improvements

PERCENT OF SITES BY BACKLOG (IN MONTHS)

1984			1987	
47.2%	18.2%		7.1%	
Less than 36	12 to 36	More than 36	59.5%	33.4%

CASE tools favored in backlogged shops

PERCENT OF SITES USING CASE* BY BACKLOG

Zero to 12	Seven to 12	13 to 18	19 to 24	More than 24
2.9	4.3			7.6

NUMBER OF MONTHS

*Computer-aided software engineering

Excelerator is top CASE draw

PERCENT OF SITES USING VARIOUS CASE TOOLS

Index Technology's Excelerator	51.9%
Nastec Corp.'s Design Aid	11.2%
McDonnell Douglas's Stradis/Draw	7.5%
Nastec's Case 2000	4.1%
Other	25.3%

INFORMATION PROVIDED BY FOCUS RESEARCH SYSTEMS, INC. OF CHARTS: AMY J. SWANSON

"Pssst! Hey, buddy, wanna buy some MIPS?" IBM makes no secret of its dislike for the measure known as MIPS — millions of instructions per second — particularly when someone wants to rate newly announced CPUs. Company officials have even resorted to the old saw about Meaningless Indicators of Performance. But last week an IBM researcher addressing the Computer Measurement Group conference in Orlando, Fla., freely quoted MIPS ratings for IBM systems. He offered a caveat about MIPS being only a measure of relative performance for ideal conditions that do not consider factors outside the CPU. Then he rated the IBM 9370 Model 60 at 1 MIPS, the 3090 Model 180 at 15, the 3083 Model JX at 8.5, the 3083 Model B at 7 and the 3033 Model N at 4.5.

Avast, ye swabbies! ADAPSO is lobbying the U.S. government to reopen its Section 301 trade case against South Korea regarding software piracy. The investigation was suspended last year when Korea promised to protect software rights, but ADAPSO says the Korean government has failed to publish the necessary regulations and has failed to stop the sales of pirated software manuals.

Rushing into print. Unisys and printer manufacturer Delphax Systems are expected to announce an OEM deal today under which Unisys will sell Delphax's 56000-2 ion printer as the Unisys B9275 for use with Unisys A and V series systems. Delphax, which claims the three-year contract may be worth $50 million, said the B9275 will be rated at 75 page/min.

Hospitalized. Former Rolm President Dennis Paboojian, 46, remains in critical condition at the Torrance (Calif.) Memorial Hospital as a result of a private plane accident that occurred Nov. 20. Paboojian and his flight instructor were returning from San Diego after a Thanksgiving visit with Paboojian's son. A Torrance Memorial Hospital spokeswoman said Paboojian, now a Rolm telecommunications consultant at the firm's Santa Clara, Calif., site, has suffered third-degree burns over 50% of his body. The spokeswoman said Paboojian slips in and out of consciousness. The flight instructor died in the crash.

Hot potato. Execucom Systems, a developer of financial planning and decision-support software, is on the auction block for the third time in three years. Travelers/Diebold Technology, which acquired Execucom in May 1986, is believed to be close to disposing of the Austin, Texas, software company. Twelve-year-old Execucom, which reportedly has revenue in excess of $20 million, was once considered the highflier of the financial planning software business; that is, until Lotus caught the IBM PC wave. The firm was acquired for $18 million in stock in 1986 by Continental Telecom, then sold to Travelers/Diebold.

Shooting for the stars. Despite not having formally announced its product, Stellar Computer in Newton, Mass., has a backlog of orders of between $1.7 and $3 million for its planned $100,000 personal graphics supercomputer, according to Stellar Founder and Chairman J. William Poduska Sr. Poduska said the backlog should augur well for the start-up.

Application management king? IBM is apparently grooming Rexx, a VM high-level programming language, as a Netview application development tool. The vendor plans to provide a high-level language "that begins with R and ends with X." IBM network management product marketing manager Robert Bailey told *Computerworld* recently. This is in response to user demand for an easier tool than IBM's C List that could be used to tailor Netview software to individual site needs. Bailey also indicated that the language will become part of IBM's SAA.

Why not the rest? Ameritech is considering whether to enter the computer leasing business via acquisition. If it decides to make such a move, the Chicago-based firm will follow a trail blazed by fellow regional holding companies Bell Atlantic and Bell South. Ameritech is the parent of mainframe data base developer Applied Data Research.

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